

A Study of Opacity in Thin Latex Films for Potential Use in Ink-Jet Printers

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Abstract

The optimisation of opacity in polymer latex films has been investigated with a view to their potential use as water based, TiO₂-free, white inks for industrial ink-jet printing. The refractive index difference required to produce light scattering in otherwise optically clear films has been obtained by the inclusion of air in the form of hollow latex particles. Very thin films (< 3µm thick) were cast on a black substrate and the optical properties of colour strength and whiteness index measured using an ICS Micromatch Spectrophotometer. Standard solvent based TiO₂ pigment containing formulations were also cast and measured for comparison purposes. Multiple determinations for latex films confirmed a high level of reproducibility in the preparation, casting and measurement procedures. The hollow latex particles employed were commercially produced and had a thin shell of non film forming cross linked styrene divinylbenzene polymer. These particles were demonstrated to work successfully in a modified industrial ink-jet printer over a short period of time. Under conditions of pumping and filtration equivalent to those experienced in industrial ink jet printing in the longer term the particles proved to be too fragile and unstable. Further work is in progress to try to overcome these problems