

RHEOLOGY SOLUTIONS

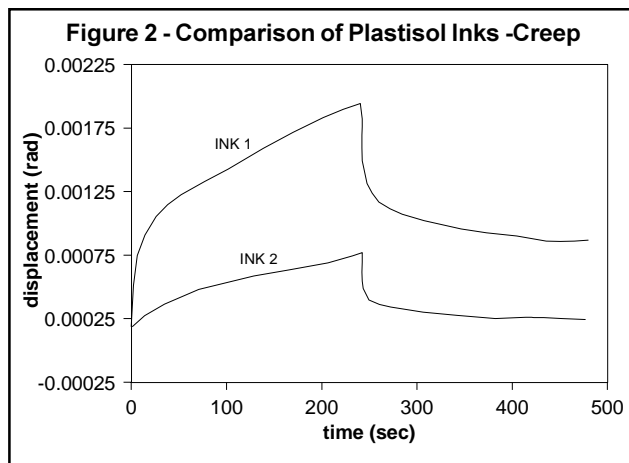
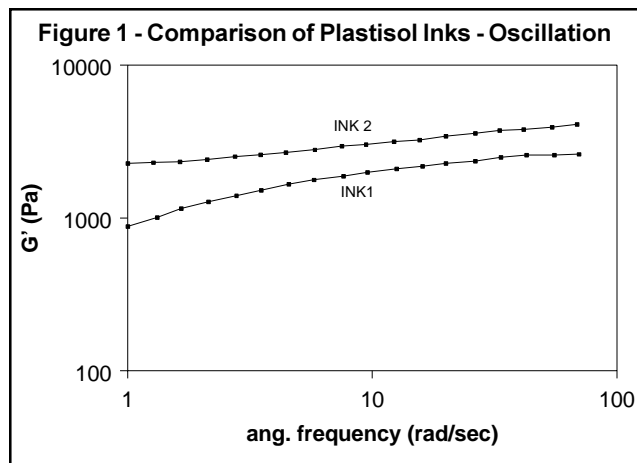
CHARACTERIZATION OF PLASTISOL INKS

PROBLEM

Plastisol inks are widely used in processes such as screen printing on T-shirts. These inks are formulated to break clean when the screen is lifted from the fabric, leaving behind a clear image. However, when the formulations are incorrect, "stringing" occurs as the screen is lifted and excess ink builds up on the screen. Traditionally, simple viscometers have been used to rapidly check ink formulations before use to eliminate problems. Unfortunately, the single point viscosity measurements from those simple viscometers often can not detect the subtle differences between good and bad formulations.

SOLUTION

Acceptable performance of plastisol inks is related more to their viscoelastic properties than to flow (simple viscosity). Hence, oscillation and creep experiments using a controlled stress rheometer provide better differentiation between good and bad formulations. Figures 1 and 2, for example, show the oscillation and creep results for two formulations which yielded similar results when checked with a viscometer, but which performed very differently in screen printing. Ink 2 gave good results, while ink 1 performed poorly. Both controlled stress rheometer tests show clear differences between the inks. Furthermore, the trends observed (higher elasticity, less compliance) for ink 2 compared to ink 1 are as expected, since higher elasticity produces the desired break clean, "snap back" behavior.



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