

Pigment Inks for Product Decoration

Introduction

Products, packaging, advertising and consumer goods at almost every level carry a print, be it design or information. Digital printing is a growing technology within product decoration as it offers cost competitive short runs, bespoke design and variable data. Typically, these digital markets are dominated by UV curable or solvent based inks, although for many sectors, such chemistry may be prohibitive. With a high focus on regulatory matters and product safety the market requires a solution to allow wider adoption of digital printing. Sensient has developed a pioneering water based pigmented technology to enable digital printing of porous, partially porous and non-porous materials to offer ultimate performance with safety and sustainability at the forefront.

Benefits

Aqueous pigment technology offers all of the performance benefits of solvent and UV without the emission of VOCs or safety issues involved with handling inks and product. Within heavily regulated markets such as food packaging and pharmaceuticals, or in industries and production sites where reducing VOCs to benefit the workforce, environment and the consumer is valued, aqueous pigment technology offers the ultimate solution. Of further benefit is the formation of a very thin layer of ink with a high color concentration, which enables maximum design benefit without creating a surface relief. Sensient's unique technology also allows for multiple substrates to be decorated without altering the finish, that is to say glossy media stays glossy and matt finished product remains matt after printing.

Sensient's focus is innovation of products with sustainable technology at their core and that really offer value to our customers.

Sensient's SensiJet® SX technology platform can be tuned to applications and printing platforms to ensure maximum performance.

How aqueous pigment printing works

When printing using water based pigmented ink the key issues to address are stability and drying.

Stabilizing a heavy, solid pigment particle in water whilst having enough pigment within this fluid to give a vibrant color when printed is a chemistry balance enabled by many years of experience.

To dry a printed film is critical for maintaining image integrity. Whilst UV curing inks instantly fix after exposure to a UV light source leaving no VOC, they contain many harmful materials and a risk of incomplete curing exists, particularly onto porous and semi-porous materials. In addition, there are risks of chemical migration of ink components through even non-porous materials, an area subject to increasing regulation. Solvent inks require heat to drive off the solvent carrier, often emitting VOCs, which should be extracted and purified.

Water based inks represent a challenge, especially when printing non-porous materials, which prior to Sensient's innovation were barely possible. Ideally the substrate should be moderately heated before, during and after printing to allow the ink to fix to the substrate. No post cure is required, although it can be added as required, and low energy heating provides an additional environmental benefit. Once the substrate leaves the printer the print is fixed and has the required application fastness.

Recommended Fixation Conditions:

Heat = 50-60°C (122-140°F)

Time = during printing process

Absolute conditions should be tuned for each application and substrate

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