

# The Nanographic Printing™ Process

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## Abstract

*This paper explains the Nanographic Printing™ process, Nanography™ technology and why they may have a profound impact on the printing industry.*

*On May 2, 2012, Benny Landa—inventor of the Indigo Digital Press—brought news of a breakthrough that may greatly advance print technology and its related economics.*

*This document will demonstrate how Nanography achieves the combined versatility and short-run economics of digital printing and the qualities and productivity of offset printing.*

*The full version of this paper is available at [www.landanano.com](http://www.landanano.com).*

## Introduction

In the printing market, 98% of the pages are not printed digitally but use technology that is essentially 500 years old. One of the main reasons is because when modern digital printing processes apply ink directly to paper, the wet ink penetrates the paper and many of the pigment particles end up beneath the surface becoming inefficient absorbers of light.

Additionally, when multiple colors are printed on top of each other, there is a limit to the amount of wet ink that can be applied to the paper before it becomes deformed and cockled. This is true for all printing processes, from offset to inkjet. This limits aqueous inks to low area coverage applications such as books and transpromotional materials—and makes it unsuitable for high area coverage applications such as commercial printing, packaging or for specific applications in the publishing sector, such as magazines or colorful books.

## The Nanographic difference

Many of the advantages of the Landa Nanographic Printing process are achieved by eliminating the absorption of the liquid ink carrier by the substrate.

It is innovative in that it utilizes the nano sized pigments to absorb much more light than other pigments, and thus permits images with ultra-sharp and round dots of extremely high uniformity, high gloss fidelity and a broad CMYK color gamut—covering at least 15% more Pantone colors than offset printing.

In addition, the ultra-small Landa NanoInk pigments—and their ability to form a very thin layer of ink—allow digital printing at very high speeds; the ability to print on ordinary untreated paper stocks, whether coated or uncoated; on practically any plastic packaging film or label stock; and the production of abrasion- and scratch-resistant images.

## Landa NanoInk™

In the course of a decade of research into nanotechnology, Landa observed that ink pigments, when reduced to nanometric scale, become unusually powerful colorants. On the basis of this discovery, NanoInk colorants are used at the core of the Landa Nanographic Printing™ process.

Landa NanoInk™ comprises ultra-small pigment particles in the 40-80 nanometer (nm) range. In comparison, good quality offset inks have a particle size of approximately 500 nm—at least ten times larger. NanoInk is water-based and therefore inherently ecofriendly.

## The Nanographic Printing process

The Nanographic Printing process begins with the jetting of billions of droplets onto a blanket, from ink ejectors that are mounted on print bars. Precise timing results in very high accuracy between print separations and high color plane registration.

A configuration of eight print bars enables the presses to print up to eight different colors simultaneously and to double productivity while maintaining print quality.

Once on the heated blanket, the ink drops spread and very quickly lose their water, forming an ultra-thin 500 nm, dry polymeric film which, when transferred onto the printing substrate, bonds to it tenaciously without penetrating it.

The formed images are tough, abrasion resistant, do not need any kind of post-drying, and leave no residual ink on the blanket.

## The Nanographic Printing economic advantage

The combination of Landa NanoInk and the Nanographic Printing process allows digital production at up to 13,000 sheets-per-hour for sheetfed and 200 meters-per-minute for web presses. This is an improvement of nearly 100% that will significantly boost the productivity of a company's digital business.

## Conclusion

The Nanographic Printing™ process opens up a new category of printing. It uniquely combines water-based NanoInk™ and a specially designed transfer blanket with the capabilities of digital printing.

With offset productivity, an offset substrate range, offset print qualities and an attractive print cost for up to 5,000 copies, Nanography is the first digital printing process that can compete in the mainstream market.

Nanography addresses the principal obstacles faced by digital technology today, including speed, quality and cost, and can fundamentally change the print industry.

## Author Biography

*Gilad Tzori is the Vice President Product Strategy, Landa Digital Printing, heading up the product management team and vertical market activity. In the course of his career of over 20 years at HP Indigo, he successfully managed innovative projects from design through system engineering, technology development, assimilation and strategic planning. He worked directly with strategic global customers to achieve rapid growth and introduced major systems into the marketplace resulting in increased annual sales of over \$200 million.*

*Note: Nanographic Printing™ and NanoInk™ are trademarks of Landa.*