

The HP IndiChrome Ink Mixing System Creating Value for our Digital Label Printers

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Abstract

Several enablers regarded the hp indigo ws4050 digital web press as the best and highly awarded innovative label press of the year. One of the reasons for this high regard springs from it's compatibility with the unique HP IndiChrome Pantone® certified ink mixing system, allowing our customers to create Pantone® or custom-matched spot colors at their own site.

The HP IndiChrome ink mixing process starts with 11 base colors – 4 Process and 7 Special. The system comes with everything needed to start printing, including hardware and user-friendly software, which allow to create a high quality color match on a variety of glossy, matte and uncoated substrates.

Introduction—HP Indigo Digital Presses and Spot Color Printing

The ability to print special colors is one of HP Indigo's significant differentiators. Our digital presses allow for up to three more ink systems to be added to the 4 basic process colors, making the presses capable of printing up to seven colors. A set of special inks such as Orange, Violet, Green, Rhodamine, Reflex Blue, Bright Yellow and Transparent, is available.

These colors can be used as optional Process inks or can be mixed (also with CMYK) in order to create spot colors. These inks are approved by Pantone® for blending simulations of Pantone® colors.

The greatest demand for printing spot colors lies in the industrial label printing sector, where very specific custom colors are usually required.

Custom colors are typically used to provide identification and authenticity, as corporate logos – or specifically to catch the eye of the end-customer. For example – various credit cards corporate logos, such as "Visa Blue", "Visa Gold", "MasterCard Red" or "HP Blue" – all those require to meet very precise color standards.

Halftone process printing generally can't accurately match these colors because of several reasons:

- Solid areas created by halftones are usually non-uniform.
- Lines and text created by half-tone printing often suffer form image quality defects, which may be unacceptable for corporate logos.

- A custom color is usually out of gamut of process printing, as those colors should often have an extraordinary vibrancy and an eye-catching effect.

Additional issues include cost – particularly for short runs, where printing a spot color as a single ink is usually more economic.

For the reasons listed above, HP Indigo offers it's customers a specially designed HP IndiChrome Ink Mixing System, with its own hardware and software, and which utilizes a common language with the variety of its digital presses.

The System Compounds and Color Matching Process

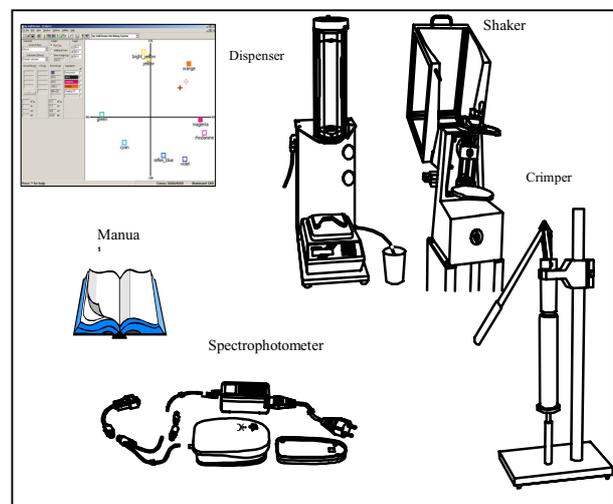


Figure 1. Illustration of the system compounds

The system consists of:

- Spectrophotometer – for analyzing a color of a printed swatch.
- Software – for calculating an optimal ink mixture.
- Dispensing unit and electronic scale – to dispense an accurately weighted quantity of base inks into empty cans.
- Can shaker – to mix the contents of the can until a homogeneous mix is attained.
- Operator's manual – full instructions for the user.

The Process of Color Preparation

After selecting the type of press and substrate, the desired illuminant and standard observer, the user can define the color by reading it with the Spectrophotometer, click in the color coordinates or choose a Pantone® color from a dropdown menu, on coated, matte or uncoated types of substrate. The possibility of selecting the Pantone® colors from the dropdown menu provides our customers with a unique capability that does away with the need to use a swatch book and eliminates errors that are apt to arise when using damaged or faded books.

After the software suggests the formulation, the exact amounts of inks are dispensed into a new can. A crimper closes the can which is then shaken for a few minutes. The can is inserted into the press and the final ink is printed. The press parameters for the specific ink are defined in the ink definition file, which the software also creates. After the printing, the spectrophotometer analyzes the printed ink's spectrum and if a small fix is needed – the software suggests it. The fix is prepared as above, added to the ink tank and the final color is printed.

If the color is exceptionally saturated, a choice of a double hit is an option and is automatically suggested to the user.

Implementing a unique iterative algorithm, the software also indicates the least methameric choice and takes into account that when the basic inks are mixed with certain fraction in the ink tank, not always they will appear on the printed page with the same fractions.

The Color Gamut

The color gamut, using 11 inks, covers 95% of Pantone® color gamut, enabling our customers to print almost any of the desired Pantone® colors.

Customer Value

HP Indigo's labels printers have a unique capability to use customized Spot colors. When a short run using a spot color is needed, the HP Indigo label printer can provide end-customers with an accurately matched, high quality printed color.

The hp Indigo ws4050 label press is cost-efficient for most of the standard label print jobs that this industry deals with. Adding the unique capabilities and features of the special colors along with the digital workflow makes this press a real differentiator in the market, leading to increased customer value.

References

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Biographies

Galia Golodetz received her B.Sc. degree in Chemical Technology from the Shenkar College of Engineering in Ramat Gan, Israel and M.Sc. in Technology Management from New York Polytechnic University. Since 1988 she has worked at Indigo (now part of HP) Israel in several R&D positions, and her current position is Manager - Special Inks and Industrial Applications R&D.

Udi Chatow received his B.Sc. and M.Sc. degree in Physics from Tel Aviv University. Since 1988 he has worked in Indigo (now part of HP) Israel in several R&D positions among them Project Manager, Ink Department Manager, and currently as R&D Materials Section Manager.