

Strategies for reaching perfect color

Pierre Panel, export sales manager at Codimag, analyzes how to achieve accurate, repeatable brand colors cost-effectively on waterless offset presses

Color preparation is a stage of the label printing workflow where time and money are easily lost – irrespective of printing process used. Today, printers use different methods to achieve special brand colors. Some organizations have standardized process, using advanced software to create the colors of the Pantone Formula Guide (for example). Others might rely on the human eye, a formula guide, and a spectrophotometer to 'mix and match' until the color target is finally achieved. Both methods provide the basis for efficiency and repeatable quality, but in a supply chain when quality and the flexibility to supply labels or packaging on a 'just in time' basis are essential, an acknowledged, standardized process is needed for both customer assurance and cost-control.

The importance of standardizing processes

Color consistency is a basic requirement from brand owners who expect suppliers to meet targets of within 2 Delta E or sometimes tighter, to ensure a globally consistent look for their packaging. It is not uncommon for customers to demand a precise brand color to be supplied on a specific substrate, delivered at short notice, and have the printer produce

the same result on repeat orders.

The Pantone Formula Guide is the most commonly accepted reference for color precision. However, while the formula guide gives a target, using it alone is only part of the solution. First, the Guide is primarily suited for commercial sheet-fed offset applications with instructions aimed at printing on coated and uncoated papers only. Label and packaging printing, however, can involve different ink sets, plastic and paper substrates, and differing printing, drying and curing processes that all affect the color.

Furthermore, because everyone sees colors differently, a solution to achieving repeatable color objectively involves dedicated software and spectral instruments used in strict adherence to press makeready procedures. Using these tools, operators are better placed to achieve the correct result on the press on the first attempt, minimizing makeready time and material waste.

The two strategies for achieving color are:

- **'Mixing the inks'** – printing with direct Pantone (or other) colors using 'Ink Formulation' software from X-Rite
- **'Mixing the dots'** – using extended gamut printing with Esko Equinox software

"In a supply chain when quality and the flexibility to supply labels or packaging on a 'just in time' basis are essential, an acknowledged, standardized process is needed for both customer assurance and cost-control"

InkFormulation Software

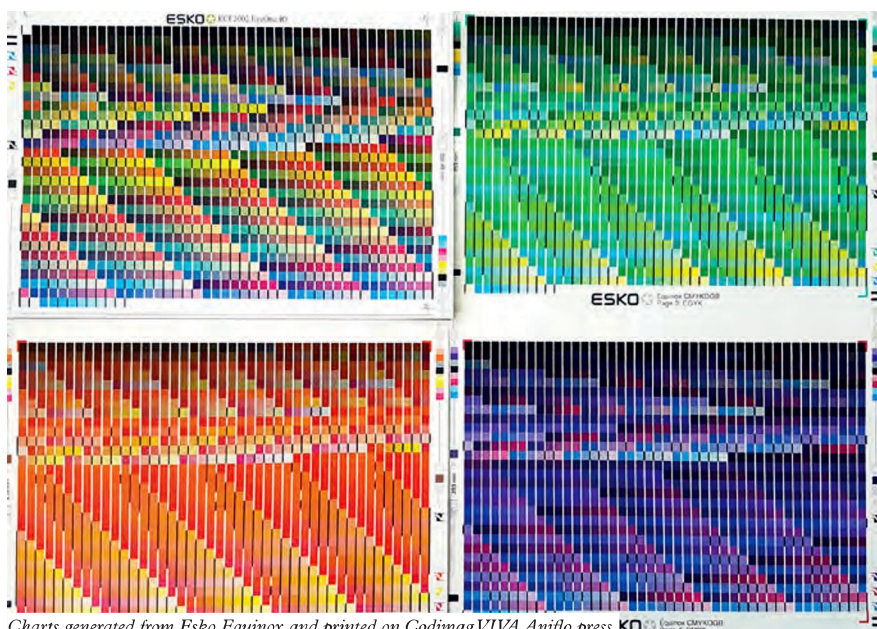
InkFormulation software provides fast, accurate and consistent ink formulation, storage, approval and retrieval, for offset, flexo, gravure and screen processes.

Designed for ink suppliers as well as printers, the software speeds up ink mixing and helps operators achieve accurate formulations for different substrates. The software can be used for flexo, gravure and screen as well as offset printing, and helps meet specifications, mix the right spot colors, and do it quickly and cost-effectively.

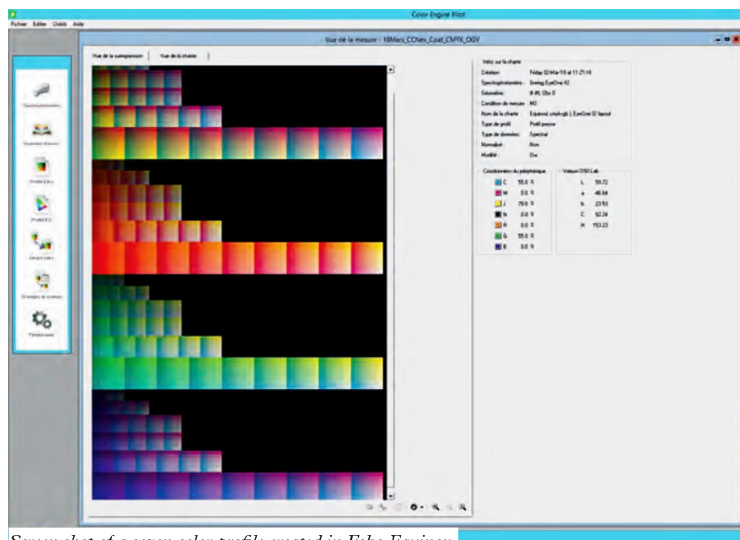
InkFormulation software performs calculations based on combinations of print surfaces and substrates using the profile supplied by the manufacturer for each base ink. This mathematical description of the behavior of the ink on specific materials is made for each substrate and printing process.

The software then calculates a number of unique recipes for achieving the target color, relying on base colors in specific quantities, differing by components or percentages. All recipes differ in their Delta E factors. The operator then formulates the ink according to the recipe provided and makes a draw-down, or physical proof, using a spectrophotometer.

The software compares the spectral curve generated by the measurement of the proof to the target. Slight corrections are usually needed, as the environment of the printing house will almost certainly differ from the 'ideal' of the ink manufacturer's laboratory.



Charts generated from Esko Equinox and printed on Codimag VIVA Aniflo press KO (Source: CODIMAG) Page 4/2008



Screen shot of a seven color profile created in Esko Equinox

Based on the curve generated, the software gives a final set of changes and the color can be prepared for the press. Provided the press is correctly set up and materials conform to the quality standard, color targets will be reached.

InkFormulation software automatically adapts recipes for different processes, so a printer can, for example, switch between flexo and offset and be assured of the same results, though the actual steps will vary. In offset, for example, ink film thickness is an important variable affecting color results which can be limited by printing speed. The printer can use the software to analyse how color results correlate with different ink thicknesses, rather than rely on 'gut feeling'. With flexo, the formulation is fine-tuned by entering values for viscosity and anilox cell angles.

Results can also be adapted for specific illumination levels that affect how

“The human eye is not a reliable way of judging color: color perception varies from person to person”

we perceive color. Operators can also choose the criteria for measuring color from the common Delta E based on L*a*b* 1976, Delta E 2000, LCH, and CMC, among others.

Expanded Gamut

The second strategy for achieving color targets is by using three additional colors (orange, violet, green) plus CMYK for an 'Expanded Gamut'. The software guides the user to choose the colors in specific proportions. Ultimately, Expanded Gamut is about variation of dot size and distribution. The common software tool for Expanded Gamut printing is Esko Equinox. It converts the color into a maximum of three colors in a four to seven-color printing process.

Equinox Color Software converts spot colors in the packaging artwork into standard colors, or adds one, two or three fixed colors to the color palette. This combination covers the majority of Pantone colors. It uses Esko's proprietary color profiles and color algorithms to calculate the colors. The software allows the operator to accurately see the color builds with the expected Delta E result, so the best option can be chosen.

Depending on the substrate, one can achieve over 90

Future-proof production

Every production upgrade you make impacts today's capabilities and tomorrow's possibilities.

Martin Automatic delivers future-proof production – versatile and stable high-performance automatic roll change technology that performs now and far into the future.

The MBS splicer with integrated right angle turnbar occupies only 65in/1.65m in the press line. Don't wait for a future expansion, use your existing floor space and get non-stop performance now.



25 - 27 September • Chicago
**LABELEXPO
AMERICAS 2018**
www.labelexpo-americas.com

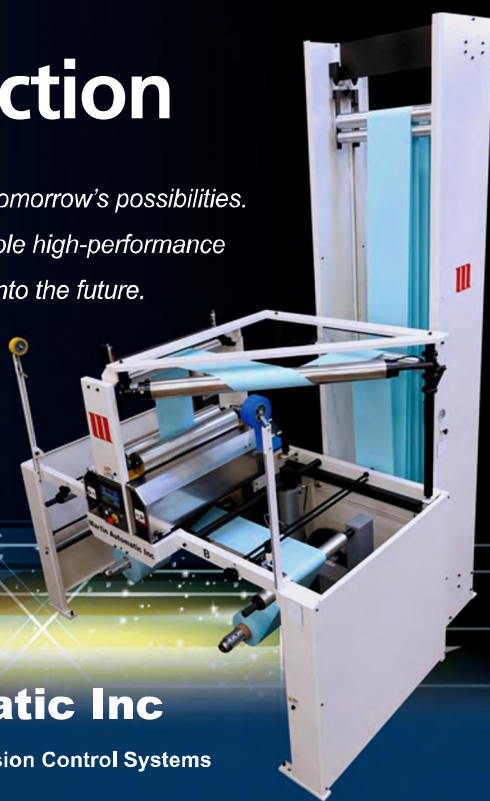
Stand 811



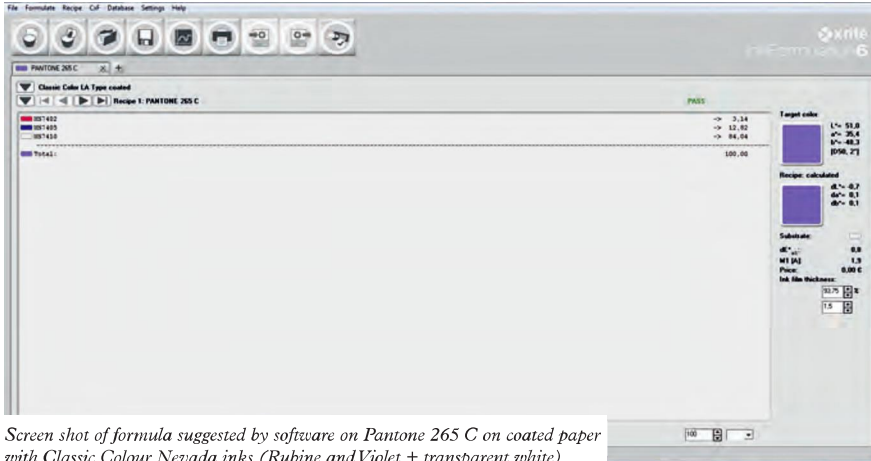
Martin Automatic Inc

High Performance Splicing, Rewinding, and Tension Control Systems

www.martinautomatic.com



OUR EXPERIENCE...YOUR ADVANTAGE



Screen shot of formula suggested by software on Pantone 265 C on coated paper with Classic Colour Nevada inks (Rubine and Violet + transparent white)

percent of the Pantone Color Book gamut with the same set of inks without specially formulated colors. Up to 60 percent of colors can be built from CMYK alone to within a 2 Delta E tolerance.

Furthermore, with advanced editing functions, operators can choose the closest Delta E coordinate for direct tones, calculated from the color profile. Color separations are converted by assuring a color coordinate without the risk of conflicting frame angles or problems relating to opacity. End results are enhanced with use of the correct high-definition plate and anilox roller.

As a result, using Expanded Gamut Printing,

presses can use the same set of inks for every job, resulting in significant savings in operational costs. Most importantly, it eliminates the need to change inks and wash up after each printing run. This means substantially shorter make-ready time, and, because there are no leftover inks to deal with, ink waste is reduced and stock management is simplified. Savings can be increased when similar jobs, such as different variations of the same brand, can be run back-to-back without cleaning and adjustment.

Expanded Gamut Printing is available for offset, flexo, gravure, and digital (where spot



Picture of Pantone book Pantone 265 C with Purple and Reflex Blue

colors can be very expensive to run), and can be built into Adobe Photoshop. Also, X-Rite has published the Pantone Extended Gamut Guide, giving a visual reference for printing a

RECO 800 High Speed Coating and Laminating Line for the Production of Label Stock Material and Siliconized Products



clear-on-clear labels



siliconized films



siliconized papers



plotter films

Lines of the product range RECO 800 are characterized by high performance, precise control of processes and unbeaten accuracy. The lines are tailored to your versatile needs, assuring you unmatched product quality and contact time. All kinds of silicones as well as pressure sensitive adhesives can be coated and laminated to all papers or polymer films available for labels on the market. The state-of-the-art technology of the RECO 800 assures you comprehensive advantages in the 24/7 production.

Contact us now!



www.kroenert.com

Visit our booth
No. 3601





Pierre Panel, export manager at Codimag

Pantone Color in expanded gamut. This helps designers and brand owners decide when to select extended gamut, CMYK or spot color for their packaging.

Printing with an increased number of colors does require careful press calibration to ensure tight registration.

Adhering to the procedure

Whichever approach is used – and both provide the basis for efficiency and repeatable quality – the printer must standardize procedures throughout the workflow, with a method, and means of recording results and tolerance levels at each stage. It is important to have a calibrated color testing system capable of simulating the printing of the label on the press to be used to ensure results correspond to the expectations of the client, and that the PDF file complies with these expectations.

It must be emphasized that the human eye is not a reliable way of judging color: color perception varies from person to person, because of physiological factors, tiredness, exposure to light, and lighting types and levels. Our color memory can be unreliable, and optical illusions show that we see what our brain tells us to see, while Instruments provide accepted objective, measurable and recordable results.

Spectrophotometry provides the highest level of color information, including color curves, and the calculation of dot area, colorimetry and color density. The spectrophotometer measures reflectance of each individual wavelength, giving the entire spectral curve. They are also used to check the quality and inks used for printing.

The imaging of plates also requires standardization. Fortunately, recent advances in computer-to-plate imaging technology mean



Benjamin Piau of Codimag demonstrating the use of a spectrophotometer

that offset and flexo printers can be assured of repeatable, high-definition quality.

Press makeready procedures must be strictly followed to ensure color stability. For flexo printers, critical points are anilox and chamber cleaning, maintaining ink stability, and calibration of the plate and sleeve, secured with tape, in relation to the anilox, with the correct pressure setting. Traditional offset printers must take care to adjust the ink tank, blankets, capacity of the drivers, and ink key settings, which must be controlled with sensitivity.

Codimag's Aniflo waterless offset

Aniflo printing technology is based on elements of both offset and flexo. It uses viscous, paste-like waterless offset inks and plates, but the ink is supplied in a manner similar to flexo. Ink is transferred from a chamber to the anilox roll, which then delivers a constant film of ink to a form rubber roller, which transfers it to the plate, then on to the blanket. There are only four inking cylinders, and thus a short inking path and a stable density along and across the web.

This creates consistent press conditions and, thus, color quality. Thanks to a high level of automation, few moving parts, and a short web path, minimal manual intervention is needed. If needed, adjustments can be made to the anilox roll's temperature – cooling it to thin the ink and reduce color density, or heating it to thicken ink and increase color density. Temperature is controlled at

About Aniflo technology

Aniflo combines offset quality, flexo simplicity and digital flexibility. It features an offset unit, with offset plates and a simple anilox delivery system that brings a uniform ink amount across the web. With low operational costs, Aniflo is an economical choice for high-definition quality short and medium runs on any commonly used label substrate – filmic or paper. Plate costs and imaging times are very short: all plates for the press can be prepared within about 15 minutes. Because it is intermittent, fewer consumables are needed, making Aniflo suited for short and medium run work. The high definition capability and superior stability means Aniflo can print in extended gamut, offering over 90 percent of the PMS colors without any need for ink changes and consequential washing.

every point in the Aniflo process, so color quality will not be affected by environmental changes, even in extreme climates.

There are no ink-water balance issues to address and no ink keys as used in conventional offset printing. Even when value-added processes are included in-line, such as semi-rotary screen printing, or flat-bed embossing, Aniflo maintains a short web path. A dancer system compensates for speed differences that occur between the flat-bed or semi-rotary process and the rewinder.

The choice between Ink Formulation and Expanded Color Gamut needs careful evaluation, as company culture, experience and available expertise will need to be taken into consideration. Choosing either color strategy can give the label printer the confidence to expand into other market sectors with the knowledge that the most demanding targets can be reached quickly and on the first attempt.

Choosing one strategy and sticking with it will yield benefits in uptime, waste levels and the ability to assure the repeatable quality to ensure success. With the right procedures and equipment, InkFormulation and Expanded Color Gamut provide the structure and a rule book for measuring and explaining color that can be agreed by the label printer, the label buyer, the packaging designer and the ink supplier, creating a framework for meeting expectations. Using the right tools, and a stable and predictable inking technology, such as Aniflo, would help converters to reach this goal.



Go to www.codimag.fr for more information