

Accurate Prototyping and Proofing

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Abstract

Over the past few years, proofing and prototyping have seen a fundamental change in the way things are done. With creative capabilities expanding, and an industry-wide need to drive down costs, traditional proofing methods have become more and more difficult to sustain. Past solutions have relied on expensive laser transfer systems to prototype and proof. However, the high prices to keep and maintain the hardware, software and materials often make these systems cost prohibitive. Additionally, key system features (such as in-line die-cutting or spot varnishes) are not available, which creates a deficit in full prototyping capabilities and in final production accuracy.

An alternative, more cost-effective, system would be the aqueous ink jet solution; however, a standard aqueous inkjet solution is not without its own limitations. Similar to the laser transfer system, the aqueous ink jet solution lacks the full prototyping capabilities needed to provide the full visual experience, and it is also limited to its substrate selection. In addition, the proof is constrained to be a color proxy because actual production stock cannot be used in this prototyping process, forcing prototypes to rely on paper white simulations to represent color.

In response to this, CGS developed ORIS Flex Pack // Web Visualizer, a system that combines virtual, on-screen visualization with complimentary hard-copy output. This complete solution was created to meet the demands not yet satisfied by other systems and to bring a new level of control to prototyping that has never been seen before.

Description

ORIS Flex Pack // Web Visualizer is an all-in-one prototyping solution, providing users the ability to prototype both on screen as a 3D render and as a hard-copy proof. The 3D virtual software component, iC3D, allows creatives, brand owners and printers alike to design custom product containers and packages and to conceptualize a product in a 360-degree environment. The software works seamlessly together with Adobe Illustrator to create virtual packaging that translates directly to the finished product. Folds, seams, and material characteristics become fully virtualized in 3D. The 3D models then can be rendered to a number formats allowing for full product review, shortening the process from concept to design and finally to production-ready files.

The technology was recognized by Printing Industries of America in 2017 with a prestigious InterTech Technology Award. The award program honors technology that is truly innovative and likely to have a significant impact on the targeted industry.

It is a comprehensive proofing and prototyping system for packaging print jobs produced on flexographic, offset, gravure, and digital presses, including:

- PE bags, pouches, film, and other flexible packaging
- Labels and folding cartons, including embossing and metallic foil printing
- Shrink sleeve packaging
- Printing on cans, glass, PET plastic, and other containers

Utilizing the ORIS color management system, a Roland eco-solvent printer, ORIS XG (extended gamut) inks, and custom CGS substrates and transfer film, Flex Pack users can produce the highest quality, color accurate proofs of packaging jobs, as well as accurate physical prototypes of proposed packaging designs. It produces both continuous tone and halftone dot proofs. The technology utilizes the Roland printer's variable head speed to allow for optimum performance.

System components

The system components are comprised of a wide range of specialty media, ink, software, and hardware.

1. CGS Professional Media – The success of the solution depends on having high-quality substrates to ensure color accuracy and visual similarity to the final product. There are many substrates to choose from depending on the type of proof or prototype needed. Some include:

- a. Transfer film – A thin PET emulsion film that is laminated to a press production substrate. At only 30 micrometers in thickness, the substrate is color-neutral and almost invisible to the process. Additionally, it can be post processed to achieve different appearances: Gloss, Semi-Matte, Matte.
 - b. Shrink Film – A large color gamut film with high shrink capabilities.
 - c. Silver Bag Film – Press-quality, silver bag film suitable for flexible packaging proofs and prototypes.
2. ORIS XG inks – ORIS Roland Eco-solvent printers have been specifically formulated for proofing applications. They include an extended-gamut CMYK ink set, plus ORIS extended-gamut orange and green inks. The system also utilizes the existing Roland white and silver inks. The resulting color gamut is sufficiently large enough to encompass almost all Pantone and other brand spot colors, and to simulate all packaging-related print conditions.
3. Software
 - a. 3D visualization software used to create and view package prototypes before generating hard copy prototypes and proofs – whether it be carton, flexible, or liquid containers.
 - b. Production engine that drives the hardware to its full capability. It is easy to operate and uses an iterative process to measure, profile, calibrate and maintain consistent color output on proofing devices, which then simulates press output for accurate color proofing and prototyping results.
4. Hardware
 - a. Roland VSi and XR series Eco-solvent printers – High-quality color output devices.
 - b. Roland LEF series printers – Used for spot varnishing and embossing finishing effects.
 - c. CGS UV-LED vacuum and exposing unit – Used for cold foil application.
 - d. CGS Custom Punch System – Custom made, German engineered punch system with 3-point registration.
 - e. Linea Laminator – Variable speed and temperature allow for lamination on a wide range of press substrates.

Technical Descriptions

Color Management

CMYK OPTIMIZATION

The CMYK Optimization feature utilizes a patented iterative technology to achieve the highest four-color accuracy. The process of creating self-correcting profiles means the lowest Delta E to the target. A four-color test chart is output at full gamut of the printer then optimized to lower the delta E. This process continues until the lowest delta E is achieved.

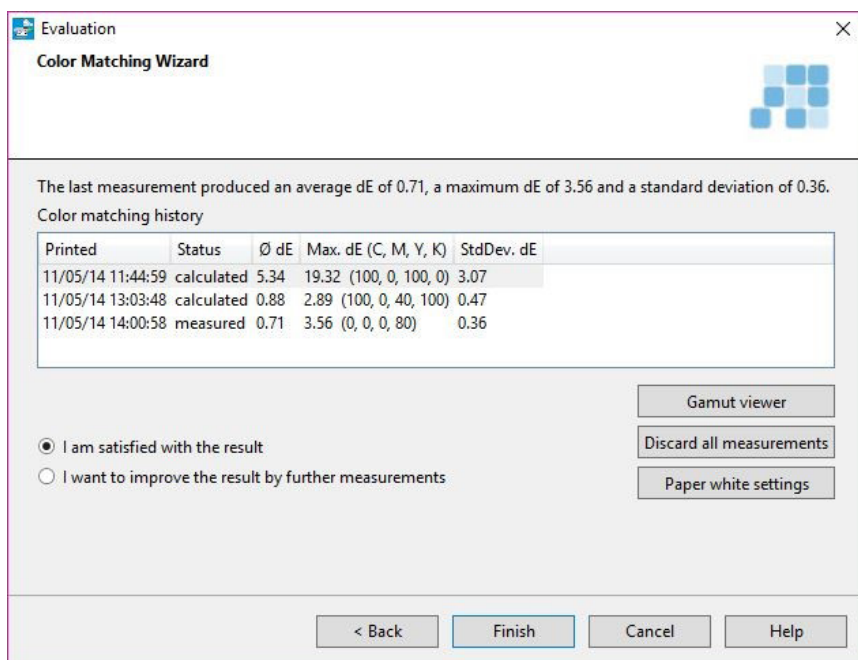


Figure 1

Additional tools for fine tuning are included.

- Selective Color Correction
- Primary Color Purity
- Selective and Global smoothing
- Input and Output Gradations
- Four types of Gamut viewers

SPOT COLOR OPTIMIZATION

ORIS Flex // Web (FPW) includes the entire library of Pantone colors and is updated to include the latest libraries. Additionally, FPW also has the ability to import CxF data in a manual or automatic method.

FPW optimizes spot colors using all 6 colors of the CGS XG INK set (CMYKOrGr) and additionally the white and silver inks can be added for any spot color recipe. Spot colors use a single iterative process whereby the maximum gamut of the device is used to build a device 6-color recipe to achieve the lowest delta E possible.

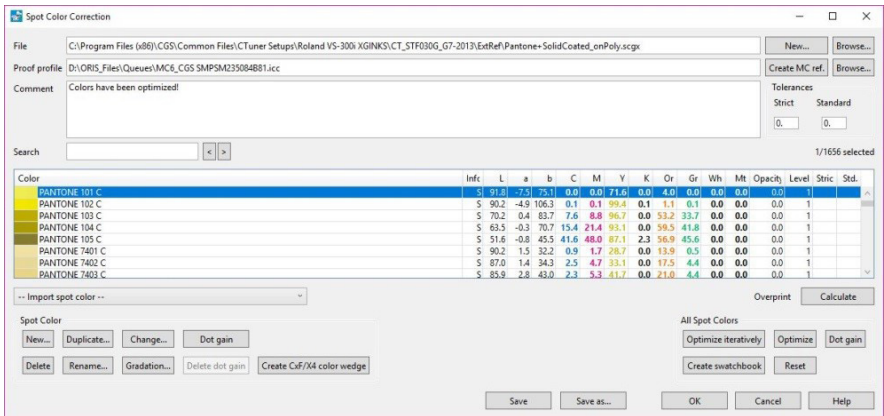


Figure 2

Additional Spot color tools include:

- Dot Gain curves
- Gradation for fine tuning (Fig. 3)
- Spot color visual optimization (Fig. 4)
- Create Cx/F/4 wedge (Fig. 5)
- Create a swatch book for printing or viewing (Fig. 6)
- Spot color designer (Fig. 7)

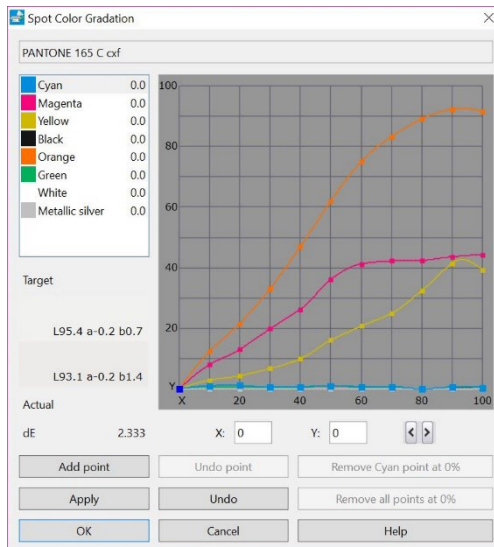


Figure 3 – Spot Color Gradation tool

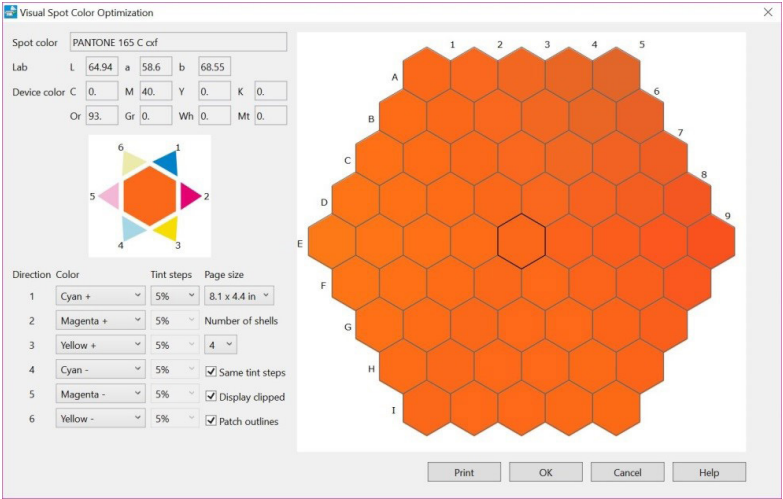


Figure 4 – Spot Color Visual Optimization

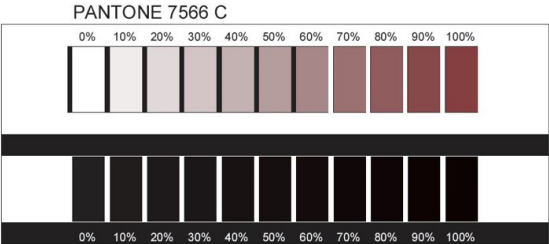


Figure 5 – CxF/4 Wedge Creation (color over substrate and over black)



Created with ORIS FLEX PACK // WEB

Figure 6 – Swatch book creation

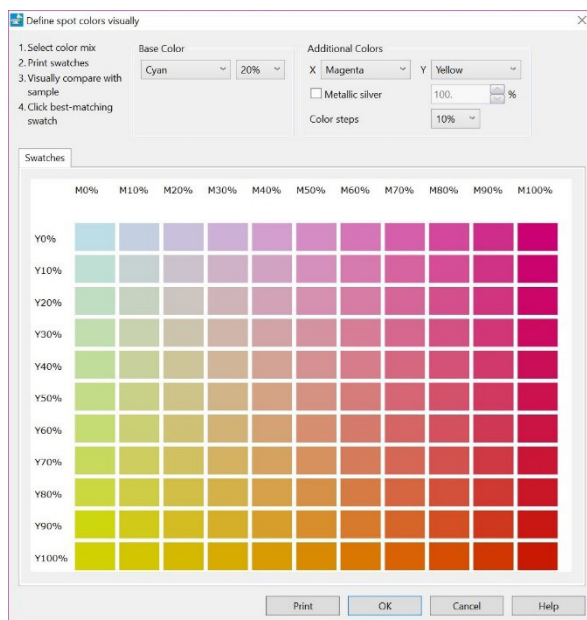


Figure 7 – Spot Color Designer

Prototyping Walkthrough

3D VISUALIZATION

The visualization component of the technology allows users to generate high-quality, digital 3D photorealistic packaging prototypes in real-time. Users can create a package within the program or by importing any standard design file. The extensive materials library supplies users with the ability to accurately simulate their final product or to create their own custom materials and finishing effects. Artwork can be seamlessly applied using the direct Adobe Illustrator link. Real-time changes and photorealistic-quality rendering shortens the design to review process as well as the overall package time-to-market before committing to print, which saves users both time and money.



Figure 8 – Real-time rendering within iC3D

3D Renders



Figure 9 – Visualizer render and Opsis WEB link

ORIS FLEX PACK // WEB



Figure 10 – High Gamut Color output on the Roland Vs300i with ORIS Media Transfer Film



Figure 11 – Lamination to any press stock for realistic prototyping and proofing



Figure 12 – Registration to 0.10 mm accuracy device to device using CGS Punch System



Figure 13 – Application of specialty effects: Varnish, Embossing and Foiling Adhesive utilizing the CGS Punch System and the Roland LEF for perfect register

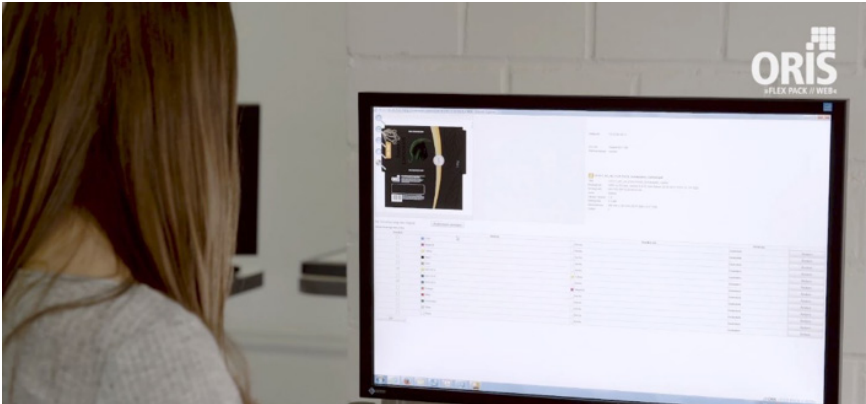


Figure 14 – Separation selecting for print & channel swapping within FPWV

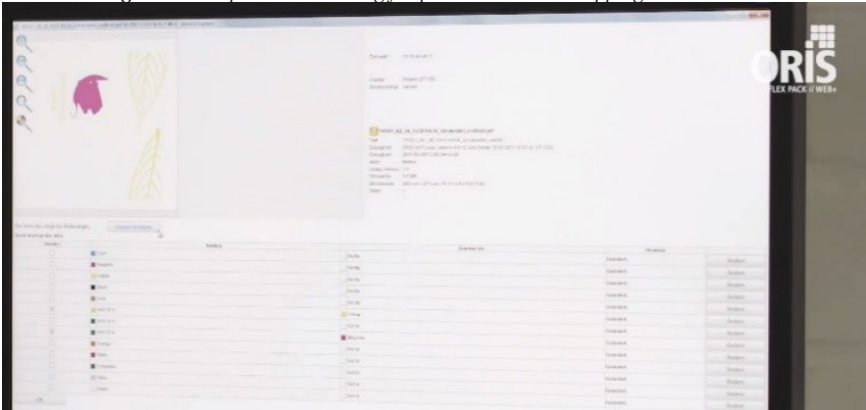


Figure 15 – Selecting the specialty effects layer within ORIS Flex Pack // Web Visualizer



Figure 16 – Printing the foiling separation on the Roland LEF in order to apply the varnish adhesive for foiling



Figure 17 – View of the uncured varnish adhesive



Figure 18 – Positioning of Cold Foil over adhesive area for application

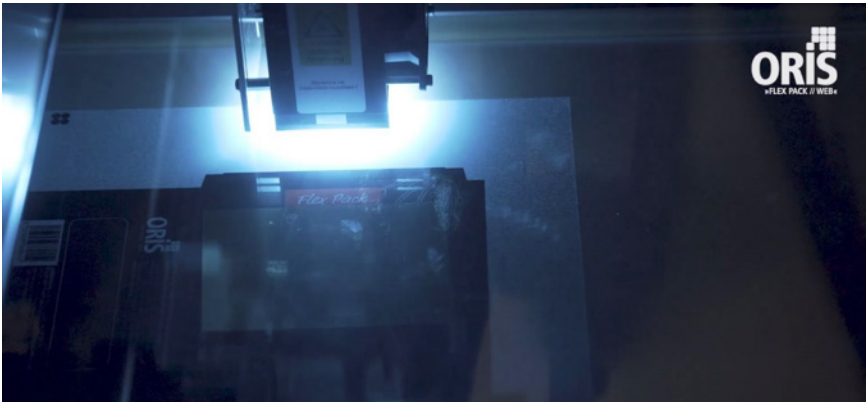


Figure 19 – Curing the cold foil under with a high-power UV/LED light

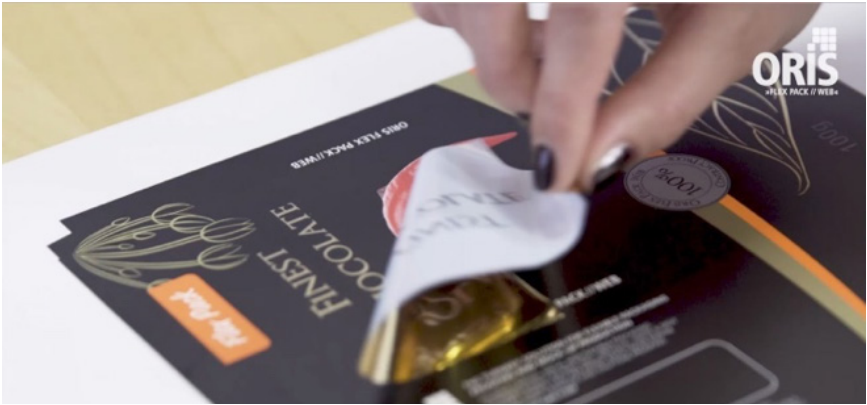


Figure 20 – Removing excess foil



Figure 21 – View of applied cold foil



Figure 22 – Additional finishing effects are possible by returning the proof to the LEF-300 to add spot varnishes

Conclusion

ORIS Flex Pack // Web Visualizer combines the latest technologies with a proven color management process to achieve unsurpassed realism for packaging prototypes. Prototypes are initially refined and proofed within a 3D environment to maximize cost-savings. This complete software solution offers users a fast, easy and cost-effective approach to producing color-accurate, high-quality proofs and prototypes for packaging, flexibles, label design and more.