Canon
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PRESS FOR SUCCESS

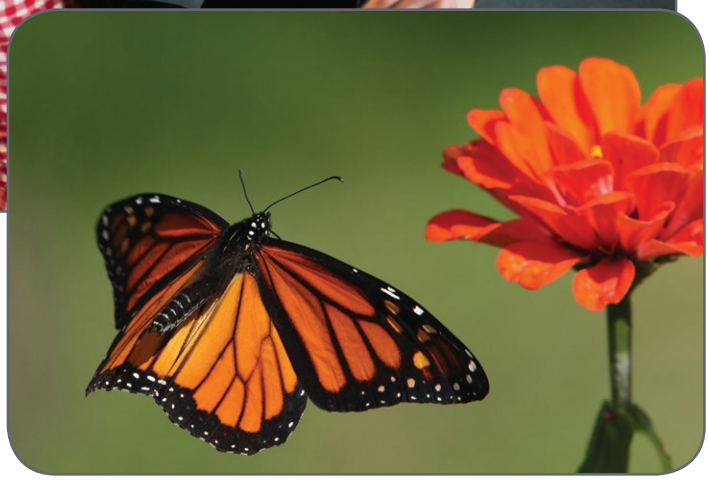
Meeting the Color Challenge

MEETING THE COLOR CHALLENGE

The world is filled with color—and it impacts and enhances our daily lives. But the colors we perceive can vary, depending on where and how they're reproduced.

COLOR CHALLENGES AND THEIR BUSINESS IMPACTS

The color print production market offers a genuine opportunity for growth and profitability. But reproducing color consistently across multiple devices, workflows, and even substrates can be challenging. Today's hardware and software include features to help files retain characteristics for accurate output, even when created and viewed on one device and then transferred to others. These features can adapt to the various nuances of settings and systems, but they're not bulletproof.



Whether your organization is new to color, adding color, or growing color, the goal is to help ensure consistent, repeatable quality and output accuracy, shift after shift. When you decide to implement or expand your color capabilities, there'll be some challenges … but these can be minimized when you collaborate with a professional like Canon.

An improperly serviced and calibrated system can lead to a loss of time, materials, customers, and profits, forcing you to focus on fixing things rather than running your business. Mediocre or inconsistent color quality also impacts customer loyalty and hurts your reputation.

The good news is that there's help. Canon has the expertise and services to guide you through the process, whatever your next steps may be.

COLOR REPRODUCTION CHALLENGES

- Color that varies from shift to shift and day to day
- Inability to match previously printed color
- Corporate brand colors that don't match specifications
- Matching colors across different devices
- Different substrates give different color results
- Transparent colors aren't reproduced accurately
- Printed colors that don't match screen displays

THE PRODUCTION COLOR "ECOSYSTEM"

Color predictability is influenced by the relationship between design software settings and settings in the output device RIP. The key is to synchronize settings between the front-end and the output, so as to help ensure consistent color.

At its most basic, a production color system consists of a design workstation, a print engine with raster image processor (RIP), and a hand-held spectrophotometer. As a production environment expands into a larger enterprise business, different equipment might be added, depending on the type of work involved. Such additions could include:

- More workstations
- Inkjet proofers and digital presses
- Large-format output devices
- Offset presses

As your business grows, it's essential to make sure that all devices operate in a consistently similar fashion, such as printers that produce the same color output from the same digital inputs. This allows work to be routed to those available resources at the time of need – the hallmark of successful color production.

DESIGN WORKFLOW

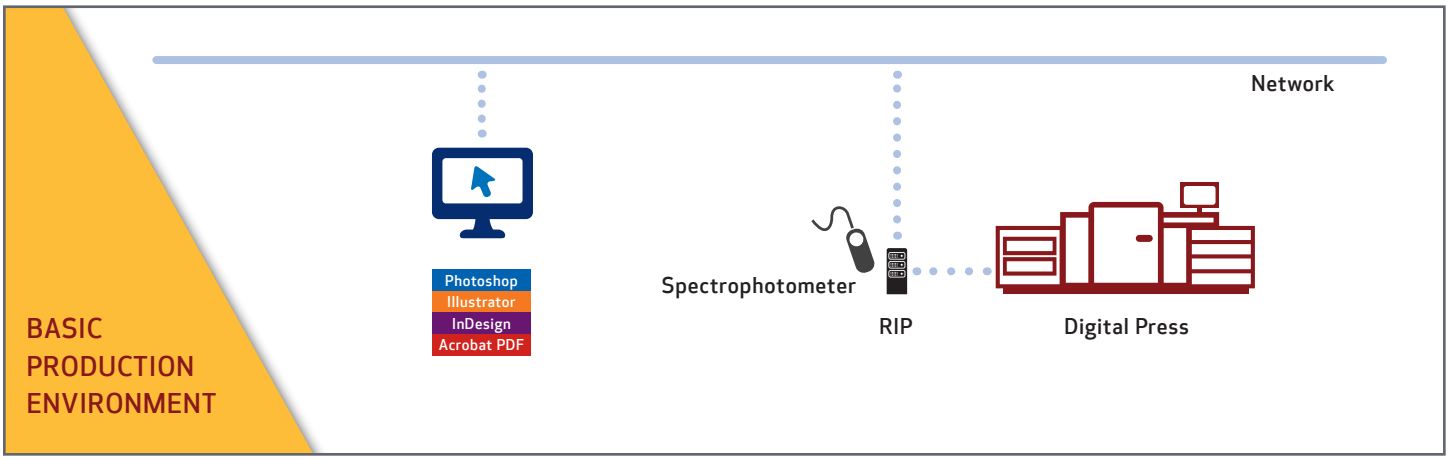
Color control begins at the design stage when managing the different source art utilized for print and digital communications.

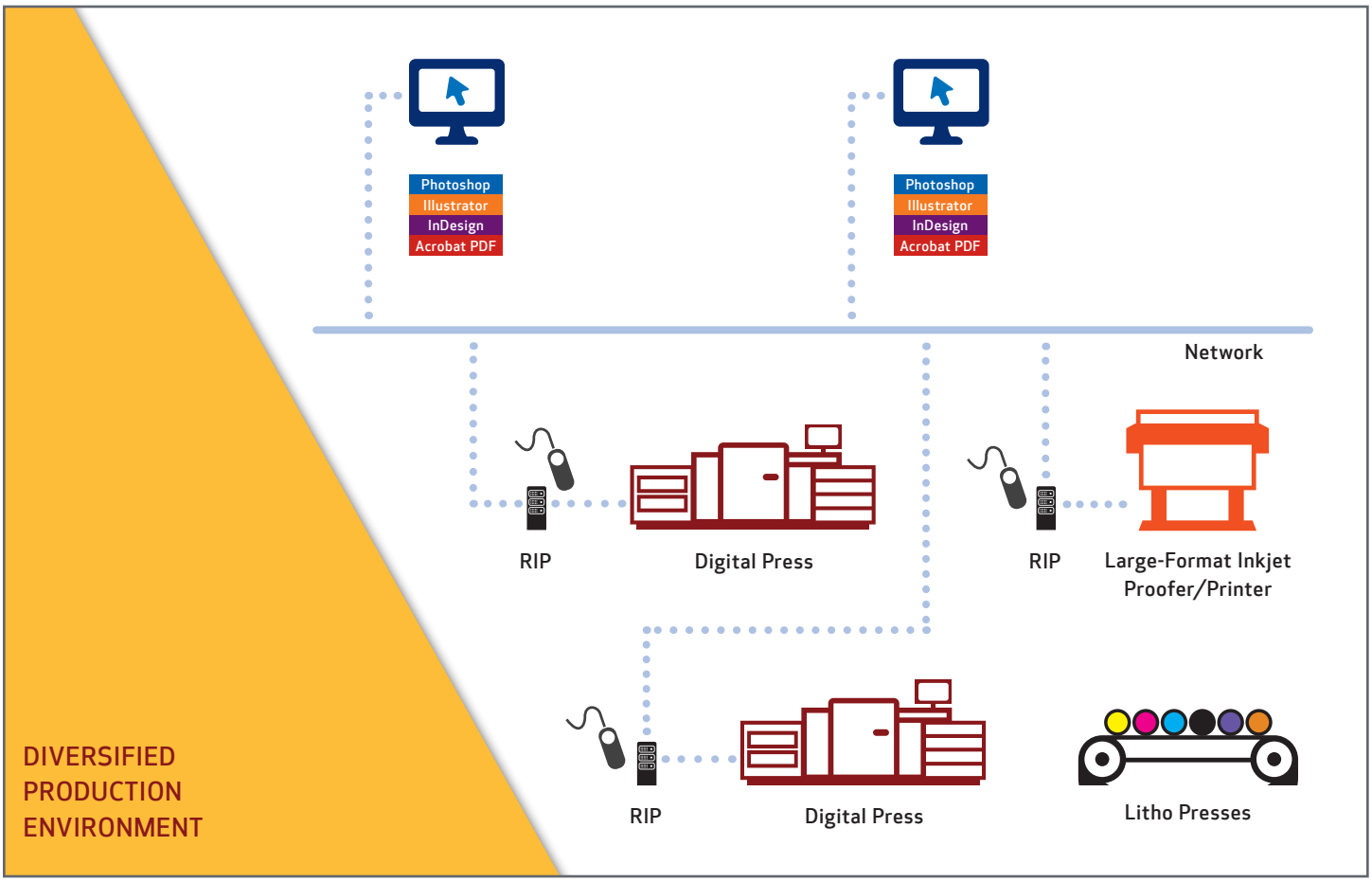
COLOR ACROSS THE ENTERPRISE

Digital color production begins with basic components: a workstation running design software, a RIP, and a print engine. As more equipment is added, it's essential that all devices speak a common color language. G7® from Idealliance is an industry-standard system that helps ensure consistent gray-scale appearance and repeatability across a wide range of CMYK proofing and printing processes.

CANON'S ROLE

Canon manufactures digital production color presses and large-format devices for high-quality color reproduction. It offers a wide range of solutions that leverage its technology and expertise as well as collaborations with industry leaders like EFI®, CREO®, and X-Rite®. Canon also provides professional services—including G7 implementation—for content creators, equipment operators, production managers, and business owners.





DESIGNING FOR DIGITAL OUTPUT

The colors we perceive can vary widely, depending on where and how they're reproduced. A frequent complaint within production environments is that the output doesn't match other printed output or what was shown on screen. The primary reason for this? Lack of proper color management.

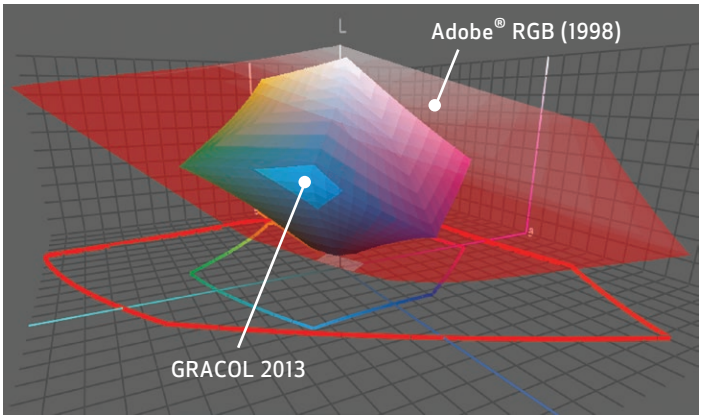
Color management is a system that enables a workstation and the design or imaging software to communicate a common language with output devices. Different components comprising a production workflow use different technologies to handle color, and these need to be synchronized.

COMMON COLOR REPRODUCTION CHALLENGES AND SOLUTIONS

Problem	Best-Practice Solution
Printed color doesn't match screen display.	Implement a fully color-managed workflow from design to print.
Color seems to change from day to day.	Implement a process control system to measure and track changes over time and correct them.
Grays look reddish.	Make gray-balance correction a part of your regular color calibration procedures.
Colors look flat.	Implement Standard Operating Procedures (SOPs) to ensure that setup, make-ready, and day-to-day printer performance are measurable and correct.
Transparent color layers don't process correctly.	Explore the key principles of transparent layer processing and investigate use of the Adobe® PDF Print Engine (APPE).

Devices also have varying color gamuts, or ranges, with which they work, so one device might produce colors that others can't. Properly implemented color management workflows make it possible to achieve consistent and predictable color output, enabling you to align the individual personalities of separate devices.

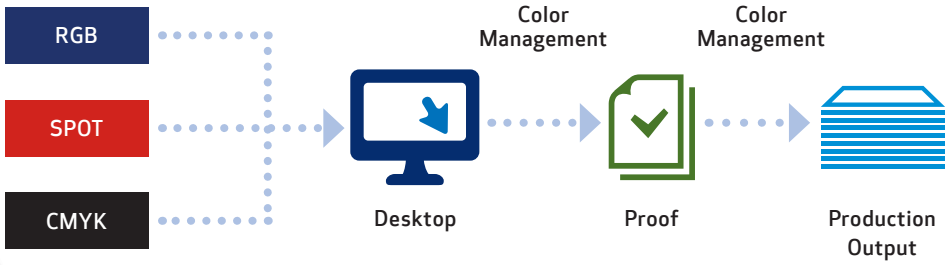
Without proper color management, customers are often tempted to correct color on-press, on a job-by-job basis. This method can be labor-intensive, not transferable between workers or different presses, and can be inefficient and costly.



A comparison of the color gamuts of Adobe RGB 1998 working color space and GRACOL 2013 reference print condition.

COLOR MANAGED WORKFLOW

Managing the various color spaces throughout the proofing and production stages is critical for predictable output.



HOW COLOR MANAGEMENT WORKS

A color management system translates the different technologies used by the display and printer via **profiles**, which describe the range, or gamut, of each device. A color management system references this information to more accurately reproduce colors among all profiled devices.

Designers create documents that look correct on their screen or desktop printer and send them for output. The file is interpreted and queued for printing, during which time its characteristics may change. Designers may not know the precise characteristics of the output device or they may not embed their source color profiles into the document. It's critical for designers and production workers to collaborate at this hand-off.

Digital design and page layout software also play a role in the production color process and can pose challenges if not utilized properly. In addition to printer settings for color, page creation software applications also enable a range of color settings. Designers and prepress operators must choose where color is to be managed—in the design application or at the printer—and make sure that color isn't managed in both places, thereby leading to undesirable results.

TIPS FOR OPTIMIZING YOUR COLOR CAPABILITIES

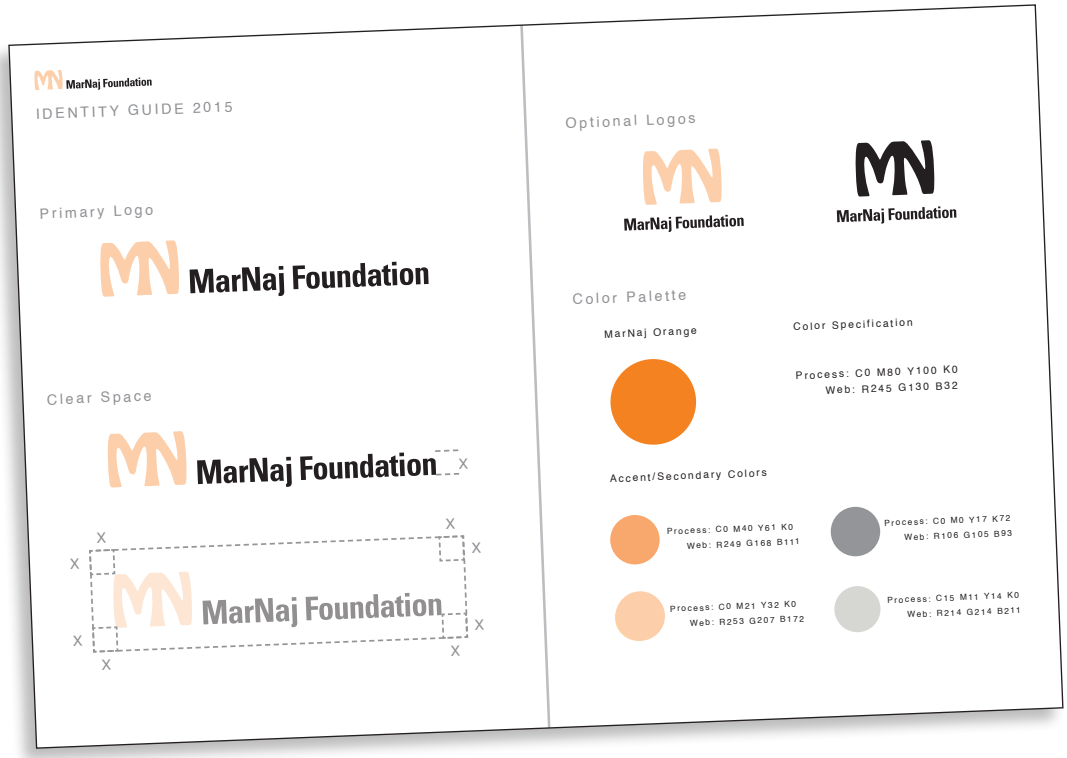
- Calibrate your display using industry-standard hardware (a colorimeter) and software.
- Learn about the soft-proofing tools in Adobe® Creative Suite.
- Establish ideal color and performance standards for your enterprise.
- Explore the benefits of RGB workflows.
- Embed source color profiles in your design work.
- Learn about the different forms of Adobe Acrobat® PDF files.

CANON'S ROLE

Canon can assist at all stages of your color management implementation, including hardware and software profiling, measurement and calibration, aligning all color management options across your production landscape, and helping to educate your organization.

PROMOTING CONSISTENT BRAND EXPRESSION: SPOT COLOR

Color is one of the most critical components in creating and protecting brand identity. Many brands are represented by unique or proprietary colors formulated specifically for a particular brand or corporate logo colors.

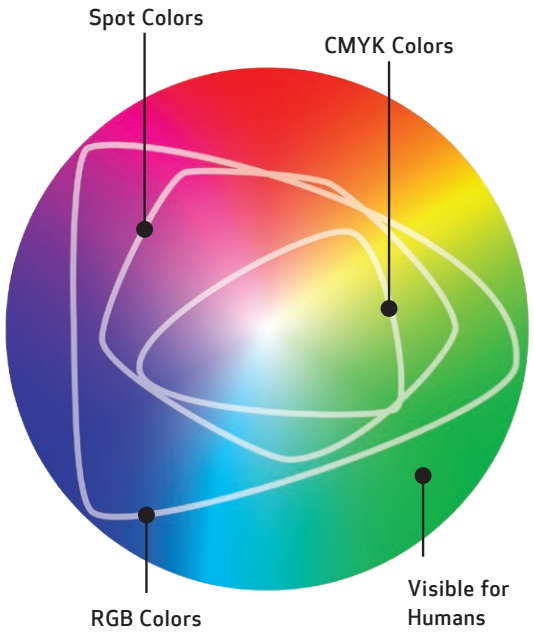


Others use "spot" or referenced colors, which are non-CMYK colors printed in addition to the standard process colors. Referenced spot colors are published in color palettes and swatch books used by designers and print specifiers. The main referenced custom color palette in the U.S. is produced by Pantone (PANTONE® Colors), with others used elsewhere. Both types of color have accurate, specific reproduction guidelines that serve to reinforce corporate identity and are of vital importance to brand owners.

From the point of view of those who design and produce printed pages, spot colors are specified individually, processed separately, and evaluated to tighter tolerances than other graphical elements on a page. There are five challenges to successful spot color reproduction:

1. Ensuring output accuracy
2. Maintaining consistency (or repeatability)
3. Eliminating design file and design software anomalies
4. Adapting for different substrates
5. Adjusting for the effects of viewer subjectivity

COLOR GAMUT COMPARISON



Graphical representation of common color gamut compared.

GOT A MATCH?

In most digital press systems, spot colors in a document are managed by an in-RIP color library that contains a lookup table (LUT). The LUT maps incoming spot color names to output device-color CMYK recipes. The spot color library in the imagePRESS system is approved by Pantone to validate the correctness of the device-color recipes. It's important to note, however, that not all Pantone colors can be matched; some are out of gamut for CMYK toner. In those instances, the closest match possible is automatically given. However, users can still change the match according to personal preferences.

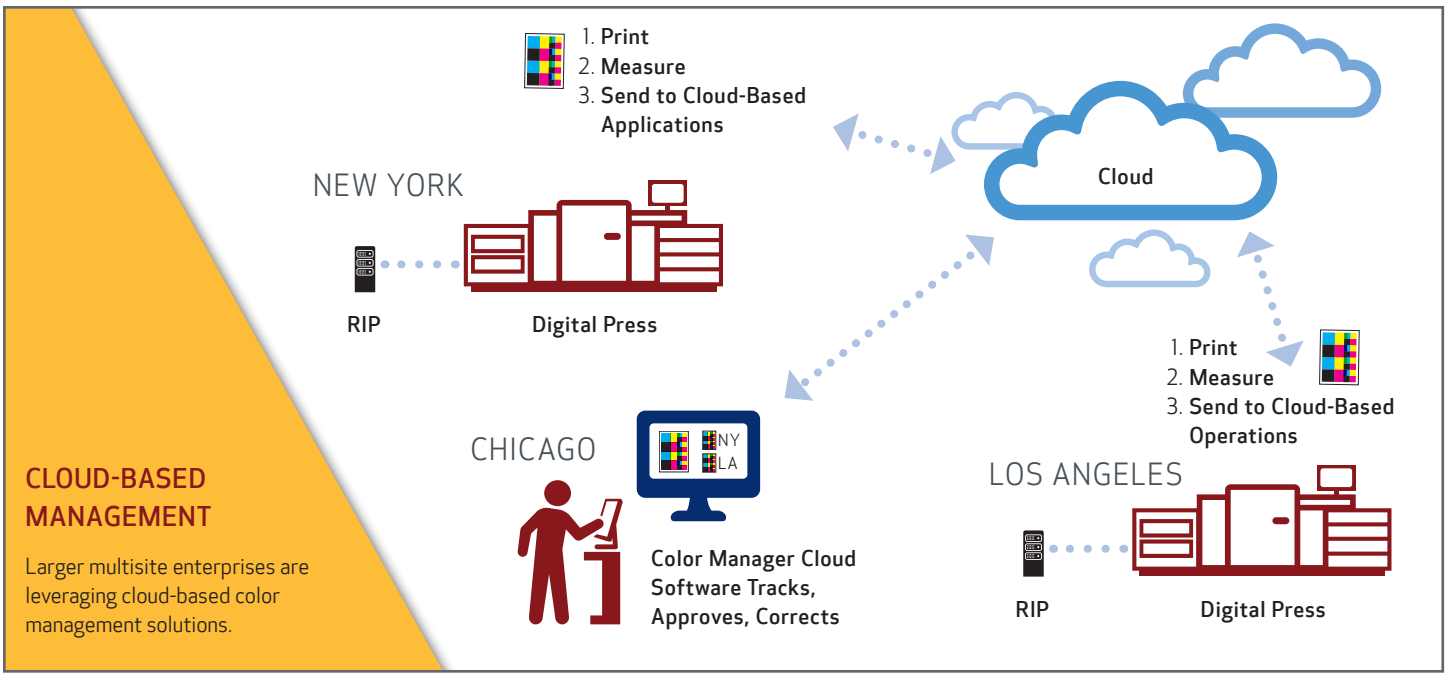
COMMON SPOT COLOR CHALLENGES AND SOLUTIONS

Problem	Best-Practice Solution
The corporate brand identity color looks wrong when printed.	Learn what can be done to improve spot color predictability, repeatability, and accuracy.
Spot colors created in PowerPoint® never seem to reproduce correctly.	Learn which color workflow engineering steps must be taken to ensure that spot color specifications are sent, received, and processed correctly across applications.
Spot colors change from substrate to substrate.	Profile all substrates for consistent results.
Spot colors used in transparent layer designs no longer match after flattening.	Explore the key principles of transparent layer processing and investigate use of the Adobe PDF Print Engine (APPE).

COLOR MANAGEMENT ACROSS THE ENTERPRISE

Enterprise color management requires managing the entire printing fleet so that all systems and equipment are in harmony. Just as problems can occur when rendered output differs from display color, impacts on a color production business can be significant when color differs from press to press and location to location.

Synchronizing color across different devices involves color space definitions and transformations. Though seemingly complicated, it's really not. Simply put, to implement enterprise-wide color management, graphical elements in your print production can benefit from a targeted reference condition such as GRACoL®. The result will be optimized performance and consistency, both from the applications in the design workflow and the digital data that drives the printer.

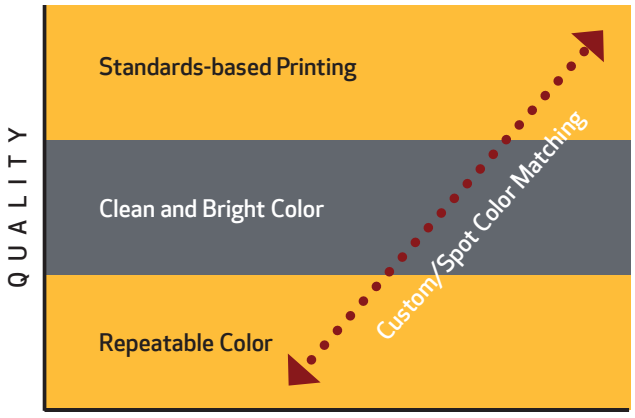


As a start, a target color space needs to be put in place for each printing device across the enterprise. Then, repeatable print performance within an acceptable tolerance must be established and maintained.

For system-wide appearance matching, G7 technology from Idealliance is being widely adopted across commercial printing enterprises. G7 comprises a specification as well as tools and certification programs. It adds a level of enterprise-wide rigor based on measurable quality standards that enable accurate and efficient color production.

When correctly implemented, a fleet-based color management solution will help ensure a shared, consistent visual appearance.

HIERARCHY OF COLOR CONTROL



KEY ELEMENTS OF A WELL MANAGED COLOR WORKFLOW

The key elements of a color-managed workflow involve obtaining accurate profiles of your output devices on the papers used to print. You can then convert source color designs into the appropriate output color space for the press and paper combination intended for the job. Using the targeted output color profile to generate a color-accurate screen display for soft-proof approval prior to production saves time and money while increasing workflow efficiency.

- **Repeatable** color refers to a predictable degree of day-to-day sameness in the printed product.
- **Clean and bright color** refers to gray-balanced output with natural flesh tones and no artificial vividness.
- **Standards-based printing** refers to specification-driven, automated processes with measurable quality and performance targets.
- **Custom/spot color matching** can be required across all quality levels; it refers to matching specific colors, such as logos or branding, to a customer's specifications.

COMMON COLOR PRINTING CHALLENGES AND SOLUTIONS

Problem	Best-Practice Solution
Multiple output devices don't print alike.	Implement an enterprise-wide color management system.
Different papers produce different color results.	Profile all substrates for consistent results.
Output not matching the file or comp.	Implement SOPs and certifications to standardize production.
White boxes appear around drop shadows.	Learn how transparent layer designs that interact with color can produce unwanted artifacts; learn workflow process procedures to ensure that these problems are solved before they make it to print.
Highlighted detail in the original is missing in the print.	Implement SOPs to ensure that setup, make-ready, and day-to-day printer performance are measurable and correct.

CONCLUSION

Meeting the production color challenge is about effectively implementing and managing the production color process.

Whether your work involves a basic configuration of workstation, RIP, and engine, or you run an enterprise-wide color production business, some key elements must be in place. These include color-managed workflows, standard operating procedures, regular calibration and maintenance, and adherence to industry specifications and practices.

The goal is to deliver day-to-day consistency, quality, and performance, all of which will benefit your bottom line. To get there, you can rely on Canon. In addition to imagePRESS digital production color presses and other color output devices, Canon also offers a range of professional services for content creators, equipment operators, production managers, and business owners. It can help advance your production color business to the next level—and "PRESS for Success" now and into the future.

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