ACHIEVING ACCURATE AND CONSISTENT COLOUR IN DIGITAL PRINTING

Wolfgang Passler describes the relevance of process control

INTRODUCTION

This article is intended for professionals in the digital printing industry who require a RIP independent solution to achieve accurate and consistent colour. It explains process control in digital printing and addresses the current shortcomings.

WHAT IS PROCESS CONTROL IN DIGITAL PRINTING?

Process control in digital printing is a series of actions which ensures output meets expectation by managing variables which can impact production. The main objective is to ensure accurate and consistent colour reproduction by creating a tailored solution for each printer and media combination.

Even with readily available innovations, the shortcomings of current practice in process control include tedious manual labour, inaccurate guesswork and wastage due to unseen changes to printing conditions.

Using technology, such as the Barbieri DOC Process Control Solution which incorporates leading edge methods for process control, ensures accurate and consistent results for optimal performance and saving costs.

CHALLENGES IN DIGITAL PRINTING

Digital printing professionals must ensure colours are accurately reproduced. As technologies evolve and demands change, digital print volumes are increasing. Digital printers will increasingly need to cater to a range of different substrates, evolving imaging technologies and inks.

Without process control, businesses can be impacted by:

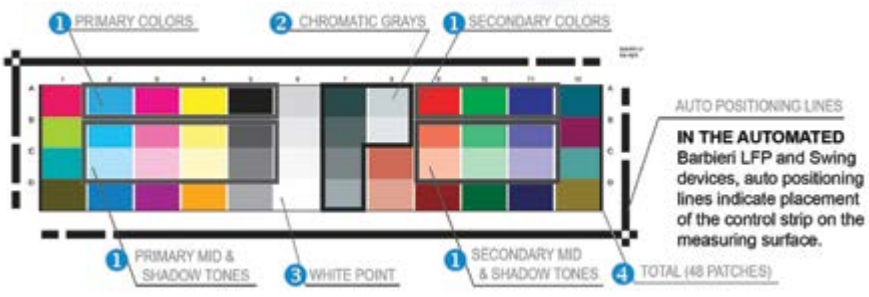
- Production downtime.
- Wasted ink and media.
- Shipping, application and removal costs.
- Damaged client relations and reputation.
- Lost revenue and missed opportunities through lack of competiveness.

On a day-to-day basis, changes to printer conditions can go undetected, occurring if there is any change to temperature and humidity, substrate and ink.

STANDARD PRINTING WORKFLOW

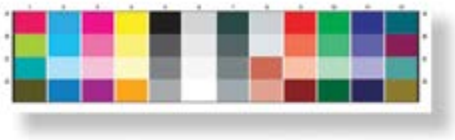
The workflow for printer configuration involves selecting a printer configuration and material combination. Calibration and profiling are then performed. The verification process then analyses if printing conditions have changed. Measurements are made on a control strip, generating a quality report and enabling evaluation over time and in multiple locations.

The Barbieri SpectroPad including DOC option on Barbieri's DOC



Barbieri DOC operates with an industry compliant, proprietary control strip

1. SETUP
Print and measure a control strip.
This printer/media combination is auto saved as a reference file.



2. DAILY CHECK
Select the saved reference and measure the control strip.

3. REPORT
Results shown on device or PDF.

Most process control solutions are based on three steps

Colour measurements in each of these steps has to be made after eventual post-treatment in order to ensure colour accuracy on the final product. Just for verification, a measurement immediately after the printer can make sense, in order to discover variations on just the printing process.

WHAT ARE THE BENEFITS OF PROCESS CONTROL IN DIGITAL PRINTING?

Improving process control has a range of benefits in digital print production:

- Assesses print conditions daily, before production starts.
- Eliminates the need to cut large format media (using a portable device).
- Processes measurements on the spot (using a portable device).
- Enables production to be monitored over time and in multiple locations.
- Uses a benchmark, or initial reference file, to determine printing conditions.

HOW DOES PROCESS CONTROL IN DIGITAL TEXTILE PRINTING WORK?

Most process control solutions are based on three steps (here shown on the example of Barbieri DOC Digital Output Control).

1. Set-up: create and save a reference file

Set-up is only performed once for every printer/media combination. After calibration and profiling, a control strip is printed on the selected media. This control strip is measured using a suitable spectrophotometer. A reference file is automatically created and saved as a pre-set, based on the selected printer/media combination. Alternately, an external 'absolute' reference such as FOGRA or IDEAlliance can be used.

2. Daily check: print and measure control strip

This check is performed daily, before production starts. It is based on the saved reference file created during setup. A control strip is printed on the media. In the device's DOC option, the saved job with the reference file for the printer/media combination is selected. The control strip is measured within seconds for an instant pass/fail result.

3. Report: instant pass or fail results

Results are instantly displayed as pass or fail on the device screen (when using the Barbieri SpectroPad) and also saved as a PDF. The generated report shows the printer/media combination, reference used, tolerance sets and values. This data can be transferred via WiFi or USB to monitor printer performance and quality control.

THE REFERENCE FILE AND REFERENCE PRINTING CONDITIONS

A basic requirement for colour measurement is a reference file. This reference file uses the defined printer/media combination to match measurements made on a control strip. Reference printing conditions use a characterisation data set to match data to the printed output. This characterisation data set is based on the required measurement mode (eg. M0, M1 or M2) and measuring conditions such as illumination (eg. D50), media backing and observation angle (eg. 2°).

ABOUT THE CONTROL STRIP

Barbieri DOC operates with an industry compliant, proprietary control strip. It also supports the FOGRA wedge, IDEAlliance and custom strips.

The control strip is a set of patches which meet ISO requirements. The ISO standard recommends a 48 patch minimum, including solid process primary and secondary colours, their mid and shadow tones and greys.

CONCLUSION

Digital printing professionals require a process control solution to achieve accurate and consistent colour. This is especially important given the current and forecast growth of the digital printing industry.

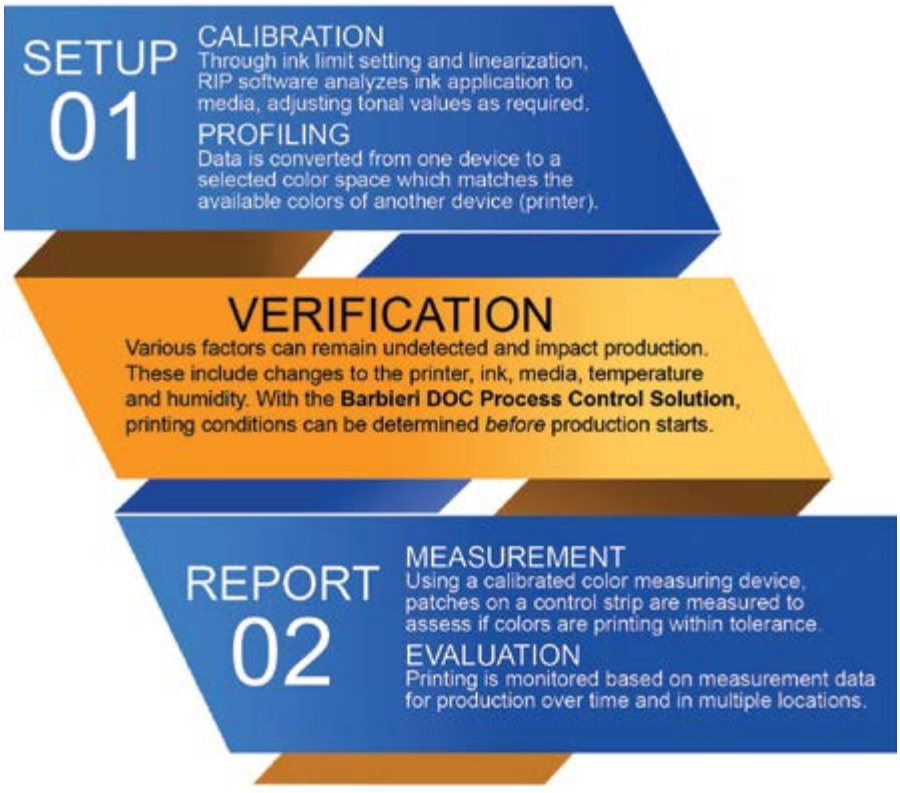
As innovations and production techniques evolve, the guidelines for process control for digital printing also evolve. Outdated practices and limited technologies affect production and revenue by causing printer downtime and wastage. Unseen factors unnecessarily impact production.

The Barbieri DOC Process Control Solution is cost effective and easy to use. It offers flexibility with media types and evaluation methods, customisation and instant results. It was devised to address the shortcomings of current practice in process control based on client experience, innovations from international industry bodies and internal research and development.

A process control solution which is cost effective and delivers optimal production is the Barbieri SpectroPad including Barbieri DOC.

Barbieri is an internationally operating manufacturer and supplier of intelligent color measurement systems which ensure the highest image quality for professional digital printing. The international Barbieri technical laboratory continuously discovers new features, characteristics and applications to improve products and assist clients for improved performance.

This article is based on a white paper written by Tanja Polegubic during an internship with Barbieri Electronic as a research component to the Master in Color Design & Technology (first edition) from the Politecnico di Milano, Italy. ■



Barbieri's standard printing workflow

Wolfgang Passler is Vice President International Sales & Marketing at Barbieri

Further information:

Barbieri Electronic, Bressanone/Brixen, Italy
tel: +39 0472 834 024
email: wp@BARBIERIelectronic.com
web: www.BARBIERIelectronic.com