Case Study

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Laboratory printing machines

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PACKAGING

SAUERESSIG project highlights **benefits** of digital color communication in printing processes

As a result of advances in digitalization, a lot has changed in the packaging and printing industry in recent years. How digital color communication compares to the conventional process of ink formulation was tested by SAUERESSIG in cooperation with printing specialist ppg > flexofilm GmbH.

Printing ink transforms packaging into a lasting impression for consumers. Color helps products and brands to express their identity, as it is the first thing that catches the consumer's eye on the shelf. Not only from a marketing point of view but from an aesthetic perspective, a balanced color concept and consistent color control are extremely important. Standardized control processes at multiple supply chain production sites and consistent print quality of the final product are top priorities and have clearly defined checks in place to ensure color standards are maintained.

Until now, the process of color control has been associated with an enormous expense of resources such as time, material, and energy. To ensure color fastness on packaging, physical mock-ups are produced, long set-up times are required at the press, test prints are run, and print approvals are made in person on site.

As a leading international provider of services across the entire prepress stages of any design implementation, the SAUERESSIG Group has been offering comprehensive expertise for decades relating to rotary print tools for gravure and flexographic printing processes, embossing rollers, cutting and creasing tools, as well as special machine construction. Since 2018, c.INKTEC has been adding a space for creative ideas and product innovations to the portfolio.

With a wide range of laboratory and testing facilities, the Innovation Center at the SAUERESSIG Vreden site offers comprehensive support for any kind of packaging development. By using various pilot machines, it allows for the creation and testing of inks for gravure, flexographic and offset printing. Well-known brands and experts from the tobacco and packaging industries have been using the services and developments for a long time.

A key objective of c.INKTEC is to create a more sustainable and transparent supply chain – and this relies on digital value creation, intelligent systems and innovative services, while at the same time aiming to avoid costs and routes that are currently one of the biggest pain points for customers. In this context, the use of the cloud-based software solution c.CLOUD is of great importance. It offers the opportunity to conveniently handle digital color communication between all stakeholders and provides complete transparency in terms of consistent color management.

The **challenge**

Inconsistent colors

Achieving color targets through visual matching while maintaining color controls and achieving excellent print quality at different production sites is a top priority for retail brands and printers. Product packaging and the associated consistent brand identity must meet the highest quality standards. A process that poses several challenges when using conventional ink formulation and profiling solutions, as multiple interfaces in the process chain increase the potential for errors in color communication significantly.

Until now, the ppg > flexofilm printing company has checked and profiled all color values for each print job in order to manage color consistency. The company ppg > flexofilm is specialized in the production of flexible packaging for food and hygiene products. A wide range of technologies are used, including extrusion, flexographic and gravure printing, as well as various laminating and converting techniques. Increasingly, new solutions relating to design for recycling, renewable raw materials, and the use of recyclates are being developed.

In conducting a case study in cooperation with the printing specialist ppg > flexofilm GmbH, the color technicians from c.INKTEC have tried out the benefits of the innovative process. Under production conditions, the c.INKTEC experts tested the formulation and settings of inks for printing flexible packaging using the gravure printing process on a Rotomec RS 4004 press. The conventional process of ink setting using purely visual methods was compared with the new digital SAUERESSIG c.INKTEC workflow. Both processes were qualitatively compared and tested by spectrophotometric measurements.

The **objective**

Worldwide color consistency based on digital processes

The goal for the c.INKTEC color experts is to provide a consistent and accurate color output at all times, worldwide, on many different substrates, with diverse inks and printing processes. In improving the process, the c.INKTEC team have enabled the print provider ppg > flexofilm to produce more sustainably and efficiently at scale. Additional adjustments within the color kitchen and on the press become superfluous, and a consistent and global brand recognition is ensured at all times.

The conventional process

Colors on the test bench

The c.INKTEC color technicians first examined the conventional process of formulating colors in the area of film packaging, in order to determine the resulting efforts and costs.

Under conventional conditions, the inks had to be measured using a physical color sample ahead of the printing process. Based on this, a recipe was created. This was followed by ink mixing in the ink metering system with an automatic mixing unit. After a viscosity test, a preliminary proof was made on a laboratory test device. The ink formulations had to be adjusted and proofed several times to create a starting formulation for the press. With the aim of achieving the defined color targets, four additional color corrections had to be made on the press during makeready, based on the specification, substrate, and printing behavior. After a weak point analysis, the technicians converted the process to the c.INKTEC workflow and carried out a cross-check under otherwise identical conditions.

c.INKTEC **&** c.CLOUD

Innovative color communication and formulation

In contrast to the conventional method, the c.INKTEC workflow already integrates within the design to print process at an earlier stage, enabling a smooth and continuous color communication from the beginning to the end of the process chain. Ahead of the printing process, the c.INKTEC color technicians matched the ink to the required specifications for gravure printing and adapted it to the original substrate (Fig. A). Universal laboratory printing presses are available for this purpose at the SAUERESSIG Innovation Center in Vreden. As an integrated solution,

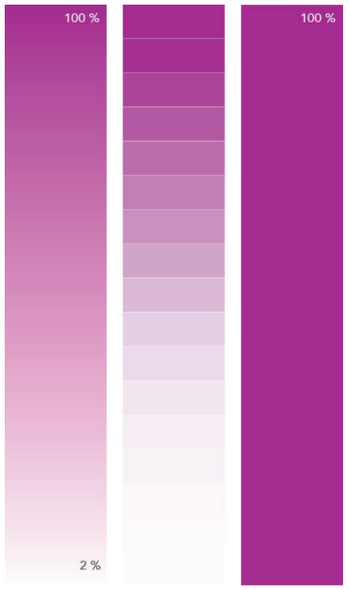


Fig. A

Fig. B

the experts were able to transfer the ink formulation to multiple substrates. Adaptation to flexographic and offset printing are also possible.

By creating the ink formulation in the laboratory environment, the printing inks could be tested and validated in advance (Fig. B). The color separations could be used to adjust the repro data, in order to subsequently achieve the desired result on the production machine (Fig. C). The cloud-based software solution c.CLOUD also came into use. It centrally stores all the information on the colors that have been created as well as the associated ink formulations, and can be reached anytime, anywhere in the world. The downstream process took place on site in the ink metering system at ppg > flexofilm. Here the c.INKTEC ink formulation was fed to the automatic mixing system. The inks were dispensed in a 20 kg container and were already provided with gravure solvent mix. To restore the ratio to the original, the inks were recalculated in advance at a ratio of 70% to 30%.

To obtain a comparison with the conventional process for the study results, a viscosity test was also carried out and a press proof was produced. Compared to the conventional process, however, the ink only had to be adjusted once. The press was then set up and the print result compared with the color master. The color correction in this process could be cut down to one pass on the press, which also reduced the maculate of the press proof significantly.

Fig. C

Positive **results**

Developments that pay off

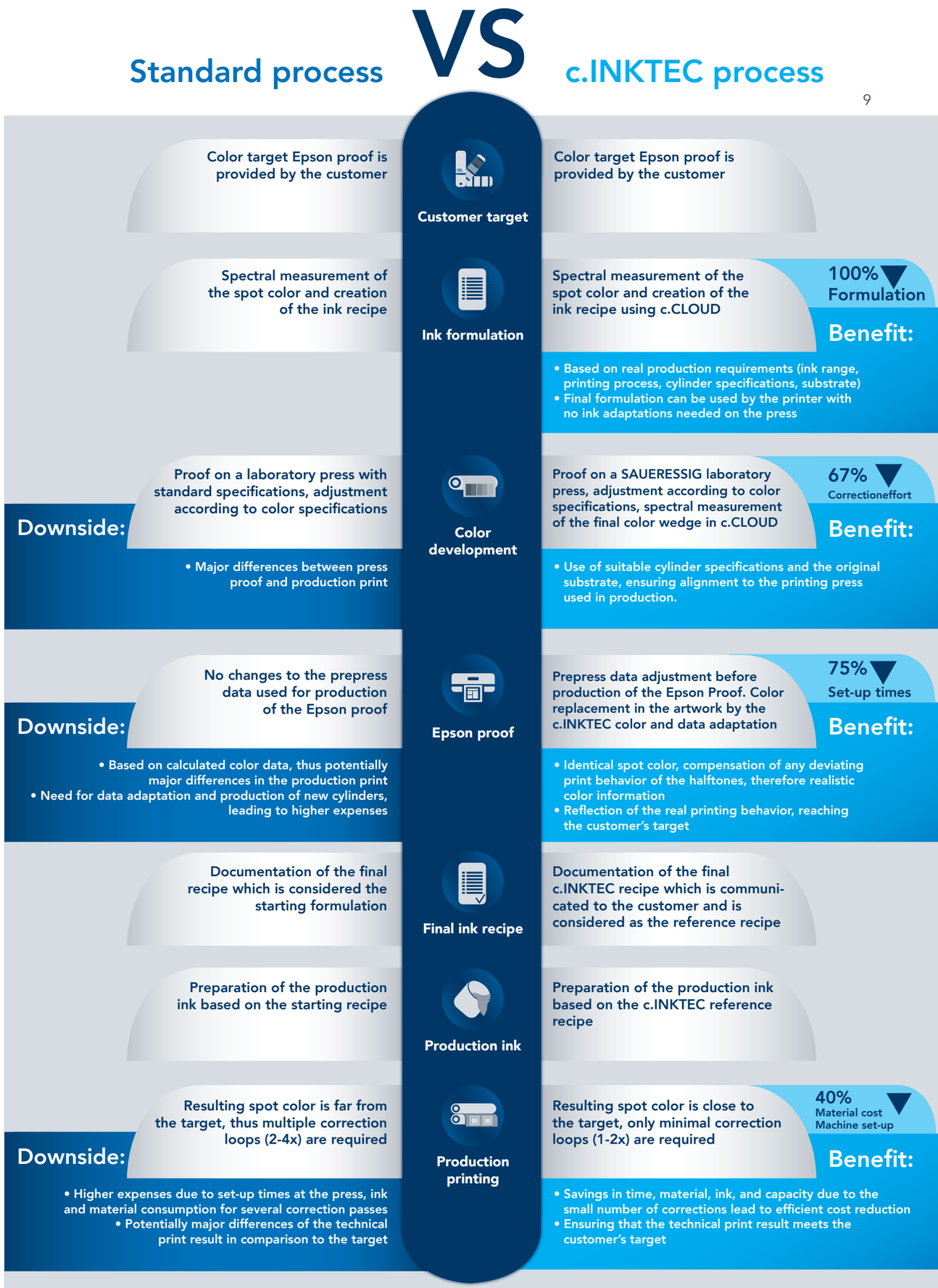
As the results of the case study are consistently positive, it is shown once again how important a holistic solution approach is in order to receive a good print result and to significantly reduce correction loops and setup times in the print shop.

The time required to create the ink formulation for ppg > flexofilm is reduced by 100%, as this is created upstream in the c.INKTEC laboratory, independently of the printer. A saving of 67% has been achieved in color separations and corrections prior to production. At the same time, there is a considerable reduction in resources in the print shop. The time required for adjusting the press was reduced by 75%, as manual intervention in the printing process was reduced to a minimum. Material costs for press setup were also minimized by 40%.

Ingo Büning, Senior Sales Manager of the SAUERESSIG Group, is convinced that color deviations of the production run to proof will soon be a thing of the past and states: “The analysis has shown that good preparatory work in color communication pays off. Costly and time-consuming corrections on the press can definitely be avoided.“ Thanks to the holistic approach, the process optimizations can also add benefit in follow-up projects. c.CLOUD conveniently handles digital color communication between all stakeholders and provides complete transparency along the entire supply chain.

Today the c.INKTEC color specialists are working on further optimizations of the process chain. The next big step into the future is the development of virtual reality-supported processes that will enable business partners to move through the world of color regardless of time and place. “With these new possibilities, we will be able to enter a whole new dimension in the world of color in the near future, experience products virtually and interlock our processes even more closely,“ says Christian Groh, Business Unit Director e.GEN, of the SAUERESSIG Group.

On a sustainable path along a globalized value chain, SAUERESSIG is making a positive contribution to the transformation to resource-conserving cycles – not only reshaping the way we work, but also the supply chain in the packaging and printing industry.



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