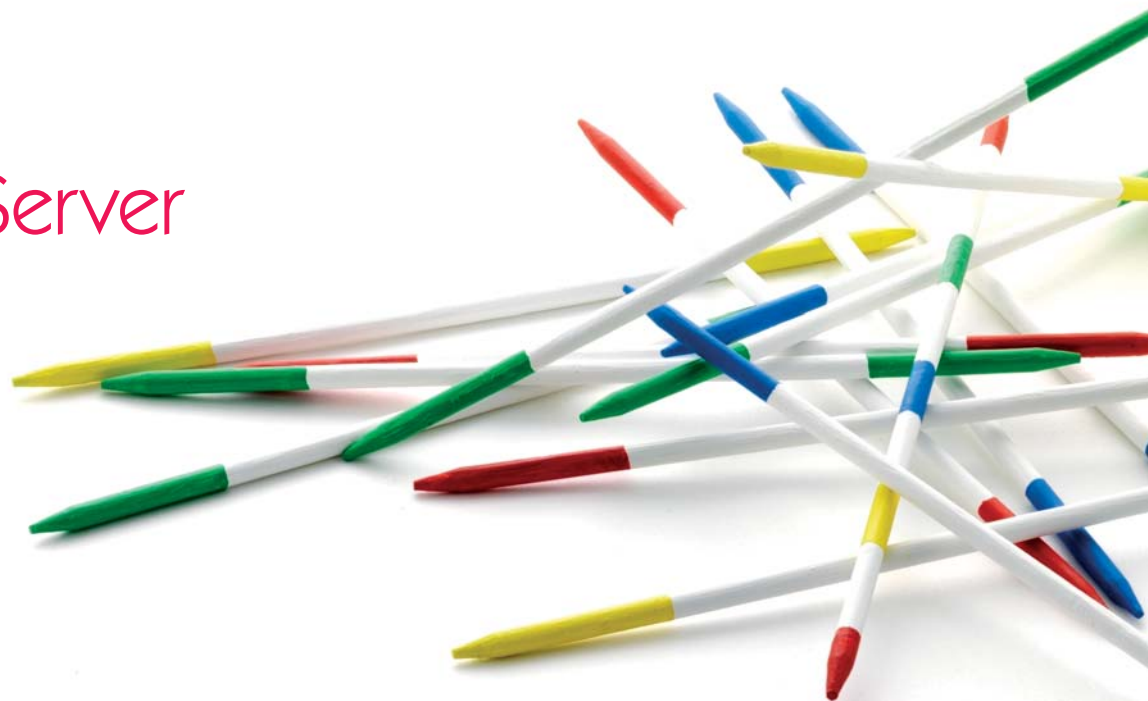**gmg** inkOptimizer

Standardized and optimized print production with GMG –
Enhancing quality and cutting costs

gmg colorServer

Enhanced print production with GMG ColorServer and GMG InkOptimizer Sheet Fed Offset

The printing industry has been in a state of upheaval for some time. Slowly but surely, a transformation is taking place, from single-piece production characterized by manual skills to industrial scale, automated production. In times of growing competition, printers are forced to confront topics like in-house standardization, process optimization and automation.

After all, on the one hand there are the customers, who demand top quality and maximum flexibility at the lowest possible price. On the other hand, there are the suppliers, who have announced price increases, in particular, for printing inks and paper.

In addition, sheet-fed offset printing is one of the most commonly used processes in the world, meaning that there is massive competition. To be able to continue operating successfully in the future, printers need to position themselves today if they want to survive and prosper tomorrow. They can do this by offering either cost advantages, high quality or particular flexibility. GMG has just the right tools for the job, enabling printers to successfully ride the storm of competition and make a lasting impression on their customers.

GMG ColorServer: maximum efficiency and quality in automatic color conversion

GMG ColorServer and GMG InkOptimizer Sheet Fed Offset give printers the opportunity to automate their workflow, and to standardize and optimize their print data. The main aim of these efforts is to enhance print quality, while at the same time cutting costs.

In this context, GMG ColorServer performs efficient color space transformations from one color standard to another. GMG InkOptimizer Sheet Fed Offset additionally optimizes the print data by reducing the level of chromatic inks and simultaneously

increasing the black component. The printing process is far more stable and greatly simplified as a result. GMG stands for top-class color management expertise in this respect. It's not without reason that the certified and award-winning proofing solutions and color profiles from GMG are the de facto standard in illustration gravure printing. However, other segments of the printing industry also stand to gain from the quality of the GMG products. GMG ColorServer and GMG InkOptimizer Sheet Fed Offset are already being used successfully by numerous well-known printers. Now, sheet-fed offset printers, in particular, can benefit from the GMG solutions.
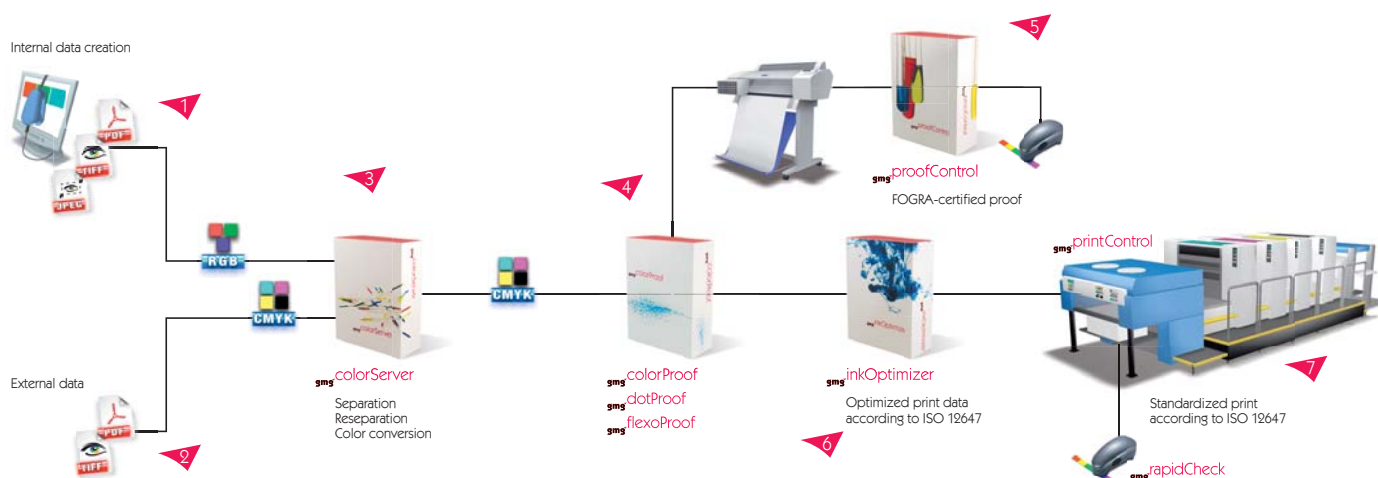

GMG InkOptimizer Sheet Fed Offset: enhanced print production due to automatic ink reduction

Color management and working according to standards are the key to success. Only in this way can color be communicated exactly, reproducible and in a controlled fashion through every step of the print production process. The GMG products do their jobs at various points in the workflow:

A typical color management workflow involves numerous companies and departments. However, the multiple interfaces frequently cause problems. To ensure that the required quality is ultimately produced, it is essential to structure the entire color management workflow as efficiently as possible. Since data can be delivered from external suppliers ◄2 or created internally ◄1 , having to work with a wide variety of data formats, and also color spaces, is inevitable.

GMG ColorServer ◄3 plays a central role in the color management workflow, since its task is to convert the data to a uniform color standard by separation, reseparation or color conversion. This is the only way of ensuring that all images have a uniform color appearance when printed. The next step involves use of the GMG proofing system ◄4 to proof the data in accordance with the printing

GMG Color Management Workflow

Internal data creation

1

3

4

5

gmg**proofControl**
FOGRA-certified proof

gmg**printControl**

gmg**colorServer**
Separation
Reseparation
Color conversion

gmg**colorProof**
gmg**dotProof**
gmg**flexoProof**

gmg**inkOptimizer**
Optimized print data
according to ISO 12647

Standardized print
according to ISO 12647

7

gmg**rapidCheck**

External data

2

6

standard subsequently to be used. The proof can be verified using GMG ProofControl **5** , which documents the fact that the proof really does comply with the predefined parameters, such as ISO 12647-2 or a user-defined in-house standard, and is valid as a contract proof. Ink reduction is then performed with GMG InkOptimizer Sheet Fed Offset **6** . This leads to improved printing properties in sheet-fed offset printing, because the optimized print data make it easier for the printer to achieve the color appear-

ance of the contract proof – provided, of course, that the press really complies with the parameters of the ISO standard or a user-defined in-house standard. GMG PrintControl Pro and GMG RapidCheck **7** are used for this task. GMG RapidCheck examines whether the press prints in accordance with the defined standard. If this is not the case, the parameters are corrected with the help of GMG PrintControl Pro. Use of the GMG products in the different process steps guarantees problem-free, high-quality production.

Reliable print production due to efficient color space transformation with GMG ColorServer

International standards, such as ISO 12647-2, PDF/X or the Media Standard Printing, help ensure defined communication between all the players involved in print production. This makes processes controllable, and the printed result predictable. But despite these guidelines, problems occur time and again in the various stages of the process:

Delivery of RGB data
As a result of the digital camera boom, the increase in media-neutral production of print data, and the possibilities offered by the PDF/X-3

standard, it is often the case that RGB data is delivered for printing. This data first require conversion to the right CMYK color space, appropriate adaptation of the resolution, and sharpening. However, separation using ICC profiles results in the color impression of image and vector elements changing to a greater or lesser degree, depending on the Rendering Intent used (perceptual or relative colorimetric with black point compensation). At the same time, the resultant color appearance is also dependent on the source and target color spaces used. Separation using different color spaces (sRGB, Adobe RGB, ECI-RGB) produces deviating, inconsistent color results.

Different separation settings

Although the print data is often available in the correct color space – having been prepared in accordance with ISOcoated_v2 (39L), for example – there are nevertheless problems when it comes to simultaneous, optimum control of the color and gray balance for all elements on the press. This is particularly the case when data supplied from different sources is to be printed in a single form. In this respect, the separation settings have a major influence on the consistency of the printed results. If the settings for black composition and total ink application do not match, the effect of the different color composition is that the differently separated elements also deviate in other directions in the event of color fluctuations.

Change of press or substrate at short notice

Imagine that print jobs created for a particular press need to be printed on a different press or different paper at short notice. To deliver optimum quality in such a case, the respective print data needs to be reprocessed, giving consideration to the paper color, the size of the color space, the total ink application, and the tone value increase of the respective output conditions. Conventional conversion using ICC profiles yields unsatisfactory results, since they change the color composition: intermediate conversion into the three-color CIELab color space causes the original separation to be lost, and the black channel is composed of four colors following conversion.

In the situations just described, intervention requires a great deal of manual effort and extensive expertise – primarily because common prepress software products have no automatic functions whatsoever, and because PDF files are not easy to manipulate. This gave rise to the wish for automated transformation of data from an existing color space to a different target color space. The name of the solution for all these tasks is GMG ColorServer. Using hot folder technology, it transforms color spaces fully automatically, in a matter of seconds, and in the familiar, high quality that users have come to expect from GMG.

Furthermore, other tasks can also be handled automatically, such as matching of the image resolution and corresponding sharpening, adaptation of spot colors via the gradation curve, and changing or normalizing file formats. GMG ColorServer is totally PDF/X-compatible in this context, since all color profiles in PDF files are detected automatically and the elements processed accordingly. At the same time, it is easy to integrate into any workflow, since it is capable of processing a very wide variety of file formats, such as PDF, PS, TIFF, TIFF/IT, JPEG, CT/LW and EPS files. GMG's 4D DeviceLink technology ensures that the input color values of the source color space are directly linked to the color values of the target color space in the color profiles. That gives the following advantages:

RGB-to-CMYK separation

The color composition of RGB data separated with GMG ColorServer is far more harmonious than that of separations generated by the ICC method. This means that less post-editing is needed, and there are fewer problems when printing (e.g. breaks, color shifts). Moreover, the innovative GMG Gamut Mapping algorithms make optimum use of the target color space in order to transfer the contrast and the image definition in the shadows into the printing color space. The paper color of the target color space is also taken into account during separation, resulting in optimum preservation of the gray balance.

CMYK reseparation

The reseparation of CMYK data creates a uniform color composition. The black composition and total ink application of data with different separation

Original separation
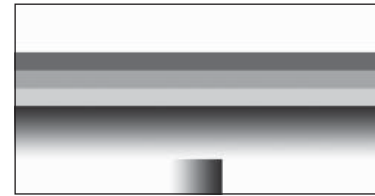
The quality of color conversion can be tested with the GMG SmoothCheck ISOcoated (27L) on the basis of the vignettes.

GMG conversion

Following conversion to ISOcoated_v2 (39L) with GMG, the original black channel is preserved.

ICC conversion

After the same conversion with ICC, the original black channel is lost and composed of four colors instead.

settings are harmonized, without altering the color appearance. At the same time, the original black channel is preserved, and that is instantly noticeable when printing. The press controls can be adjusted to the required printed result faster because all elements behave identically owing to the uniform color composition. Material consumption and make-ready times are reduced, while quality is enhanced at the same time.

CMYK-to-CMYK conversion

The CMYK data is converted from one standard to another (industry or in-house standard) during conversion. The original color composition is again preserved, meaning that, for example, a black vignette is not composed of four colors after conversion and is rendered homogeneously. If required, primary colors can also be preserved in their original form. In addition, the total ink application is harmoniously reduced by intelligent algorithms.

To preserve the color impression on different papers, the paper color is taken into account during conversion. This increases the printer's flexibility. The color space of a print job created for a specific combination of printing process, press, ink and paper can be transformed into a different color space at any time and reproduced with full color fidelity under totally different printing conditions. This makes it possible to react swiftly to customers' requests for changes, while at the same time ensuring great flexibility as regards press utilization.

Profiles included

Included in the scope of supply of GMG ColorServer is a whole range of profiles for all common standards, such as PSR, ISO, SWOP, GRACoL, JMPA/JPMA, 3DAP, sRGB, AdobeRGB and ECI-RGB. However, printers can also create their own, individual profiles using the ProfileEditor supplied.

GMG InkOptimizer Sheet Fed Offset – Optimized print production due to automatic ink reduction

Original data
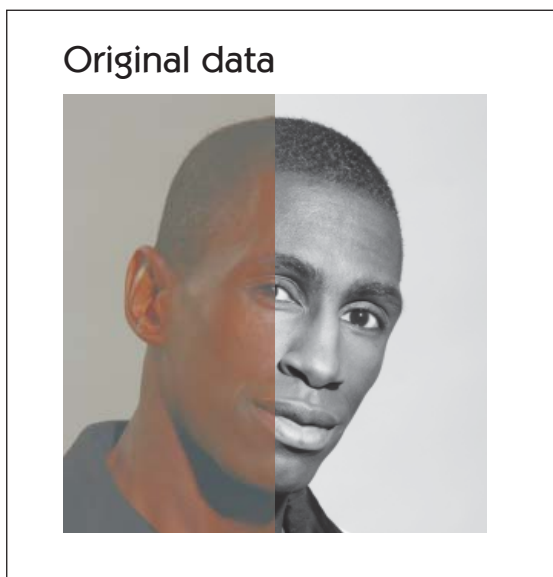
The RGB image data was separated in with GMG to ISOcoated_v2.
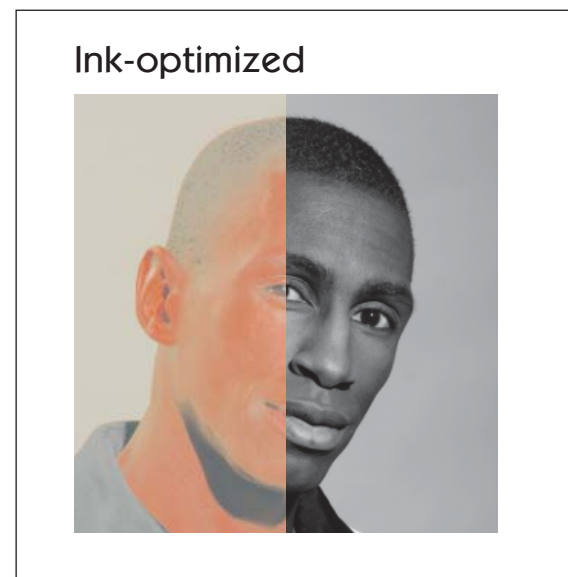
Ink-optimized

After processing with GMG InkOptimizer Sheet Fed Offset, the chromatic color component is reduced and the image is composed with far more black.

GMG InkOptimizer Sheet Fed Offset offers medium-sized and large sheet-fed offset printers a software solution for fully automatic optimization of their print data. The printing properties are stabilized and improved as a result, with cost savings achieved at the same time – important arguments for efficient print production.

Optimization of the print data is controlled using GMG's 4D DeviceLink technology. This has the advantage that the original black channel is preserved. In addition, critical elements that were previously composed of several colors are largely composed

of black after optimization. This reduces the total ink application, while the visual color impression is retained at the same time. The colorimetric difference is close to $\Delta E = 0$.

Advantages in print production

The optimized color composition has decisive advantages. Not only is the contrast and definition of images improved, but the higher proportion of black is also particularly noticeable when controlling the gray balance, since it behaves far more stably over the entire print run and reacts less to color fluctuations. This has a

direct influence on quality, since it is precisely in the case of gray that the human eye reacts most sensitively to color casts. Moreover, this is a way of counteracting crossover problems when these objects are printed in different zones. Optimized data also permits faster production of repeat jobs in the same quality.

At the same time, if ink-optimized data is used, the primary or secondary colors can more easily be adjusted to the required color result or the proof on the press. As a result of achromatic composition, the gray balance and the tertiary colors, such as brown or olive, remain more stable if the end densities areadjusted. This also has a positive effect in the event of paper-induced tone value increases. Reducing the total ink application not only saves ink, but also has advantages in terms of production engineering: since less ink is applied, it can be absorbed more rapidly, and the drying time is shorter. Moreover, there are fewer problems with offsetting, strike-through and soiling. The overall production time is reduced as a result, and printing of the back or finishing can be started sooner.

Simple integration in the workflow
GMG InkOptimizer Sheet Fed Offset is easily integrated in any workflow by means of hot folder technology, and processes a wide range of different, industry-standard data formats, such as TIFF, TIFF/IT, JPEG, EPS, CT/LW and, of course, PDF. Either complete pages or just image data can be optimized in this context. Diverse configuration options offer maximum flexibility when it comes to adaptation to customer needs.

Rapid payback
GMG InkOptimizer Sheet Fed Offset starts to pay its way after a very short time, since your performance is optimized as a result of the more stable printing properties, shorter makeready times, lower paper consumption and faster drying. That enables printers to enhance the quality, produce more economically and efficiently, and cut costs. At the same time, these advantages also have a positive impact on customer loyalty.

Profiles included
Printers who produce according to the Process Standard Offset can start optimized production immediately after installing GMG InkOptimizer. The following profiles are included in the scope of supply: ISOcoated (27L), ISOcoated_v2 (39L), ISOuncoated (29L), ISOuncoated yellowish (30L), and Gracol 2006. If production is based on in-house standards, our certified and qualified dealers can also create special profiles.

Dealer's stamp

CS_IO_SF_Brochur/02/ 04_08/en