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ADAPTIVE AND DYNAMIC CREATION AND PRINTING OF A VISUAL AND/OR COLORMETRIC PRINT VERIFICATION JOB BASED ON CONTENTS OF A COLOR CRITICAL (LONG) CUSTOMER JOB

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Adaptive and Dynamic Creation and Printing of a visual and/or colorimetric Print Verification Job Based on Contents of a Color Critical (long) Customer Job

The idea disclosed is to help in verifying at the beginning of the printing or at the beginning of some post-printing process (e.g. calendaring or lamination)) that the colors that are to be printed (or post-processed) are matching the required customer or standard specs.

Typically the print verification is a process that should be started manually in a RIP or other host (PC) SW and involves printing some standard charts (e.g. UGRA/Fogra Media Wedge), or some predefined charts (both of them "static", fixed), measuring them with a spectrophotometer and providing a pass/fail result.

In this disclosure, the chart created is adaptive (based on the real spot colors that will be present in the color critical job) and able to be verified both visually (e.g. against a Pantone swatchbook or some color chips) and colorimetrically (with a spectrophotometer). The chart printing process is also dynamic as just selecting an option the automatically created chart will be printed using the same settings as the color critical job.

The process is as following:

The RIP creates automatically a job based on the spot colors present in the color critical job to be send, and the newly created job is automatically processed by the RIP and send to the printer before and/or after the real job is printed, with the same processing settings and printing pipeline as the color critical job.

The automatically created job consists on patches, which size can be pre-defined by the operator, each one of them corresponding to a specific spot color present in the real image to be printed. E.g. if the image to be printed is a pdf containing several images and among them there are 10 spot colors used (e.g. Pantone 123, Arizona Red (Arizona Red being the name the designer has assigned to a certain color and which the print provider has agreed to reproduce), ...) then the automatically created job will hold 10 patches each one of them corresponding to each of the spot colors.

The size of the patches should be big enough to be visually evaluated by a color expert operator.

The patches should be arranged so that a minimal surface is used, and the width do not surpass the width of the media loaded in the printer.

Additionally, there might be the same color patches but arranged in a way and size that might be measured by a supported (by the RIP) spectrophotometer. In this way a colorimetric pass/fail decision can be made.

The chart job might be printed before and/or after the real (long) printing job takes place: if it is printed before, then right after printing it and while the long job is being processed and printed, it can be evaluated (visually or colorimetrically) and if it does not pass, then the long job can be stopped printing and, so, avoid wasted printed material. If it is printed after the long job is done, as it will be the first job in the roll before the long job in a post printing step (e.g. dye-sublimation in a calendar unit to the final (and costly) fabric), processing first

the chart job and evaluating it could avoid wasting lots of expensive material in case the colors are not correct.

The reason to consider only the spot colors and not the rest of the colors (basically bitmap raster colors) is because the spot colors are the most important ones in the signage/advertisement market, or in fashion or sportswear markets, which are the main markets for Large Format Printing. In signage and sportswear there are many corporate identity colors (e.g. for logos) used and they are mostly defined as spot colors.



Figure 1. Example of the layout the Printing Verification

The configuration of this function might include:

- Size of the visual patches
- Whether to include patches to be measured colorimetrically and for which spectrophotometer type (Barbieri LFP, i1IO, ...)
- Specific fixed colors to be added always

- Labels: chart name related to the long job, date, printer, printmode, color management, substrate,
- Place to be printed:
 - o Before and/or after the long job
 - o Right, Left, Center or repeated along the width of the material
- Number of copies

The Business main problem solved is the waste of material (substrate and inks) due to printing long color critical jobs with wrong colors. If evaluating a chart that is corresponding to the specific spot colors that will be printed afterwards shows that the colors are not OK, the printing can be stopped very early and evaluate where is the issue coming from (RIP, design office, printer, ...).

There are many solutions regarding print verification but all of them are:

- Fixed: they print always the same colors, either the ones coming from a standard (e.g. Ugra/Fogra Color Wedge) or the ones the user has specified manually in advance, not dynamically determined based on the long job to be printed.
- To be evaluated only colorimetrically. They do not take into consideration that the user might not have a spectrophotometer, nor that the final evaluation might not be possible colorimetrically (e.g. evaluating the color on a semi-transparent textile)
- A separate process (even if it is done from the RIP). The user must start explicitly a print verification process including printing and measuring before the actual long job printing is done. It is not embedded in the long job printing as the proposed solution does, and so it is prone to printing not exactly with the same settings needed for the color critical job.

The Advantages of the solution are:

- Print Verification is integrated into the workflow of the customer. There are no additional steps; the user just must select the dynamic print verification option before RIPping and printing the real (long) job
- Wasted material is decreased. As the print verification chart is printed automatically before (and/or after) the long job, the evaluation of the chart is done while the real job is being ripped and printed, so if the evaluation fails there will be little substrate wasted.
- The print verification is based on the colors really appearing in the real job, and interesting to the final customer: the specific to the real job spot colors. Other colors are not taken into account for that specific real job.
- As said, it might be printed before the real job or after. In the first case while the real job is being processed and printed, the print verification chart might be evaluated. In the second case, the print verification chart will be first in the roll where the long job resides. In the case of dye sublimation where the printed roll is send to a calendar to transfer the ink to the final fabric, the first plot to be calendared would be the verification chart. If right after calendaring it, it is seen that the colors do not correspond to the ones that should be, then the calendaring of the rest of the job can be interrupted

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