Vancouver Response Center
T. 604.451.2727
Toll free T. 1.800.472.2727
F. 604.451.2713
Toll free F. 1.888.767.2736

Customer support email:
callcentre@creo.com

www.creo.com

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Technical bulletin

Screening Improvements in Prinergy 2.1

In Prinergy 2.1, the screening algorithm has been enhanced to minimize moiré and provide greater flexibility. Prior to version 2.1, there was a limited selection of line screen rulings for a specific resolution. Screens are now dynamically generated for the requested line ruling. Combined with the new support for asymmetric resolutions—the ability to define height and width independently (for example, 1440 x 720 dpi)—it provides greater flexibility and support for a wider range of devices, produces better looking screens, and minimizes unwanted moiré.

Benefits:

- Added flexibility—custom line screen rulings
- Asymmetric resolution—support for inkjet printers with non-standard resolutions, and for special applications
- New algorithms to minimize patterning—mainly for the Packaging (Flexo) market
- Lower memory requirements—better use of system resources
- Support for a wider range of devices

With the dynamic screen generation, the screen angles have been optimized to minimize moiré. There is a slight angle difference between separations and with previous versions of Prinergy. We recommend not mixing plates from previous versions of Prinergy. There should be minimal impact on dot gain but it should be measured to ensure it meets your tolerances.

Most screening engines, including Prinergy 2.0.7 and 2.1, as well as non-Prinergy RIPs, will give slightly different output results than what was requested by the operator. For example, if the operator requests 133 LPI at 15 degrees, the RIP may actually output 131.4507 LPI at 15.6221 degrees, because screen rulings and angles on each separation must be geometrically optimized to prevent patterning and to form high quality rosettes.

Specifically, Prinergy 2.1 searches for optimal rulings and angles that are close to the requested values, in order to minimize multi-channel moiré, single-channel aliasing patterns, supercell patterning, and to reduce memory requirements. Within these constraints, Prinergy generates the closest possible screen set to the operator-requested ruling.

As with most screening engines, Prinergy screens the first three separations (C,M,K) at angles that are 30 degrees apart, to prevent moiré and form the rosette. Yellow is typically assigned to the fourth separation at a screen angle that is only 15 degrees from two of the other separations, because yellow is low contrast and least likely to cause visible moiré with the other separations.

Yellow moiré can be further reduced by using rulings that are up to 15% greater than the C, M and K channels. In Prinergy v2.0.7, the yellow ruling is deviated by up to 4%. In Prinergy v2.1, further improvements were made to minimize moiré by deviating yellow rulings between 6 and 14%.

These concepts are described in detail in the book *PostScript Screening: Adobe Accurate Screens* by Peter Fink, and elsewhere.

The change in yellow screen ruling has no measurable impact on dot gain (<1%), and there has been no measurable impact on presswork from these refinements so changes to Harmony tone correction curves should not be necessary although we have seen customers modify their curves anyway.

Some operators may ask, "How do dynamically generated screens effect repeatability (plate remakes)?" The answer is that Prinergy 2.1 generates the same screened bitmap each time, so that repeat plates and proofs from the same version of Prinergy will always be identical.

Dynamic screen generation is governed by a new set of constraints and algorithms that allow operators to automatically generate new screens using Prinergy v2.1 rather than having to request screens from Creo that are not listed in the menus.

About Creo

Creo is a world leader in solutions for the graphic arts industry. Core product lines include image capture systems; inkjet proofers; thermal imaging devices for films, plates and proofs; professional color and copydot scanning systems; and workflow management software. Creo is also an Original Equipment Manufacture supplier of on-press imaging technology, components for digital presses, and color servers for high-speed, print-on-demand digital printers.

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