Linearization and profiling of 11-color printers

Example: Canon iPF 5000

efi GmbH
Kaiserswerther Str. 115
40880 Ratingen
Germany
www.efi.com

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Proofing Solutions
WITH BEST TECHNOLOGY

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1 System configuration

This article applies to the following system configuration:

Software Version:

EFI Colorproof XF v3.0 SP1

Miscellaneous:

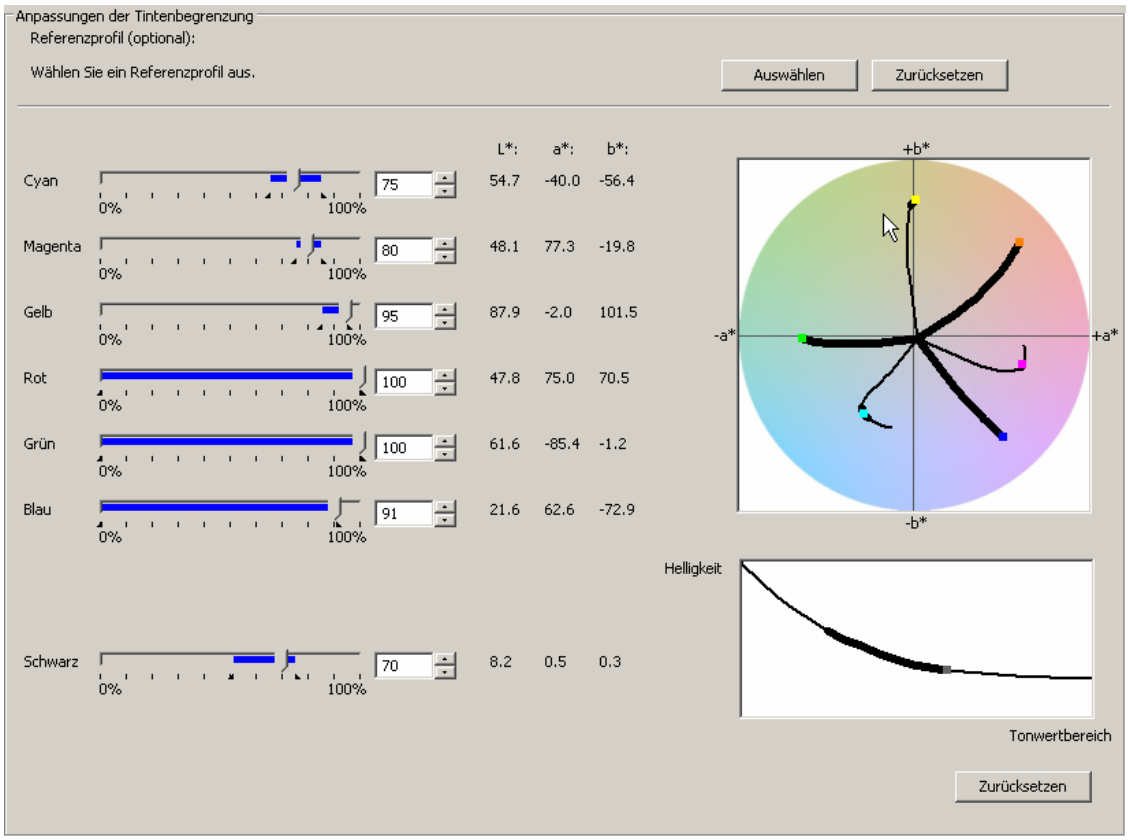
Color Manager Option is required for the profiling process.

2 Topics

This article explains in detail the steps necessary to linearize and profile the 11-color Canon devices. The 11 ink colors used are Cyan (normal and light), Magenta (normal and light), Yellow, Black, Red, Green and Blue, plus three different kinds of black: dark black, medium black and light black. There are two different dark blacks in the printer – a photo black and a matte black. Which one is used depends on the media type selection. To summarize: The printer contains 12 ink cartridges in all. Depending on the media type, 11 of them can be used at any one time for printing.

The printer can work in two different modes:

- CMYK (with light ink and all 3 black inks)
- CMYKRGB (with all 11 inks).



Each mode can be used for 600 x 600 dpi, 1200 x 1200 dpi and 2400 x 1200 dpi. The 600 x 600 dpi mode is supported only in conjunction with the printer's default halftoning. EFI technology is applied if the machine is running at 1200 x 1200 dpi or 2400 x 1200 dpi.

Since the new Canon devices offer a high resolution printing mode of 2400 x 1200 dpi, it is recommended that you speed up the processing time. EFI Colorproof XF v3.0 provides a slider bar on the new "Speed" tab for this purpose. Please select the option "Normal".

2.1 Printer preparation

2.1.1 General explanation

The printer needs to be prepared for the linearization process. This preparation includes setting the media type at the printer's control panel. The Canon printer control panel offers standard Canon paper types such as "Proofing Paper". However, this is based on a Japanese 127 g paper and the setting is not suitable for EFI proofing media. Please see section 2.2.1 for EFI recommendations. The paper type selected at the printer's control panel must be the same one to be selected in the linearization tool later on. Every paper type uses an internal pre-calibration which is set up in the printer driver.

Another very important fact to know is that, based on the paper type, the printer automatically selects photo black or matte black ink.

2.2 General note on linearization

2.2.1 Lintool - settings

As already mentioned, it is extremely important to select the same paper type in the Lintool as set up at the printer's control panel. Depending on the paper selection, the printer settings for pre-calibration and distance from print head to media are adjusted.

For the CMYKRGB color mode, EFI recommends that you choose 2400 x 1200 dpi. Only this will ensure high quality. The resolution of 1200 x 1200 is considered as a "draft" mode which makes only sense in combination with the paper type "Plain Paper". Again, this is not recommended for high quality print.

Further more EFI recommends that you choose the setting “Glossy Photo Paper” for use with the following media types: EFI Gravure Proof Paper 4245 Semimatt, EFI Premium Proof 8260 SM and EFI Offset Proof 9200 Semimatt.

2.2.2 Lintool – drying time

Yellow ink, in particular, takes some time to dry. EFI recommends that you allow a drying time of thirty minutes before measuring.

2.2.3 Lintool – total amount of ink

EFI recommends that you start by entering a value of 300%. The second target can be used to evaluate the amount of ink. If no bleeding or curling effect is visible, the value of 300% can be used for the linearization. If too much ink seems to be used, a reduction of 40% may lead to better results. These values can be taken for the rest of the linearization creation. After the linearization is finished, you should carry out another visual check on the total amount of ink. Experience has shown that the total amount of ink should not be below 300%.

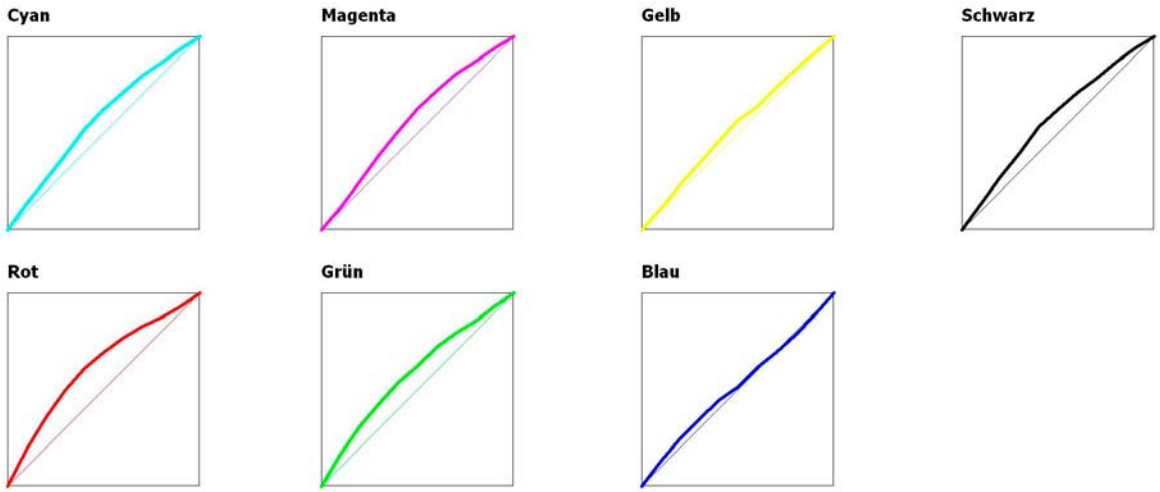
2.2.4 Lintool – Quality Chart

The Quality Chart can be used to check the 3-color black strip. In some cases a yellow shift may be visible. If so, decrease the dot gain value for yellow by approx. 3%. The dot gain can be adjusted in step 4 “Linearization” of the advanced settings.

2.3 Special notes for CMYKRGBcmkk mode

2.3.1 Lintool – Quality Report

After completing the linearization, you can create a quality report. The quality report shows, in addition to the L*a*b* values achieved, all the dot gains for Cyan, Magenta, Yellow, Black, Red, Green and Blue. All the dot gains should have a positive value. If one of the curves is not positive, increase the dot gain for this color in the advanced settings. This can occasionally happen in the case of blue ink.



2.4 Notes for profiling

2.4.1 Black generation

The black generation should be selected only in moderation. EFI recommends the following settings, based on the new profiler module in EFI Colorproof XF v3.0:

Black length 14

Black width 10

3 Summary

The new Canon devices come with a new 11-color mode. These 11 colors demand a fully compatible linearization and profiling method. EFI Colorproof XF v3.0 with Service Pack 1 was developed to meet these specific needs. However, in some cases it might be sensible to make some manual adjustments during the linearization and profiling process. This article provides details based on EFI's recent experiences.

One point worth mentioning is that it was discovered that 11-color support leads to a wider range of reproducible spot colors as well as to an improved gray balance. The use of RGB enables the engine to be used in the photo and production market.