Seeing is believing

Efi recently announced that its proofing system Colorproof XF has now reached its fourth generation, and come a long way since it was acquired from Best Color in 2002. One of the most important aspects of version 4 is that it now supports APPE 2.0 (Adobe PDF Print Engine). This is important because we talk about contract proofs on a high level, and it's crucial that the interpretation and rendering of PDF files is identical in the proof RIP, to that of the final RIP driving the CTP system.

The new version of Efi proofing system, Colorproof XF v4, supports APPE 2.0 and validation according to the new ISO 12647-8 standard. It also has a new enhance calibration procedure, which was tested by Digital Dots.

We decided to test the brand new Colorproof XF v4, but rather than focussing on APPE or JDF compliance, we were interested in seeing if the slightly modified calibration process would yield an even better result than before on RGB-output. In our previous tests of different RIP systems for colour printers, we have noticed that one of the most difficult, but crucial, area in calibration is to determine the correct amount of ink to use for a certain substrate.

The same colour printer can produce a very different result, depending on what RIP you drive it with, and how careful you are when calibrating the system. So in our test we wanted to reproduce a series of RGB-images (saved in the Adobe RGB colour space) as faithfully as possible to what we could see on our calibrated high end LED backlit monitor. Previous tests have come close to a perfect match, but left some room for further improvements.

What's new – highlights

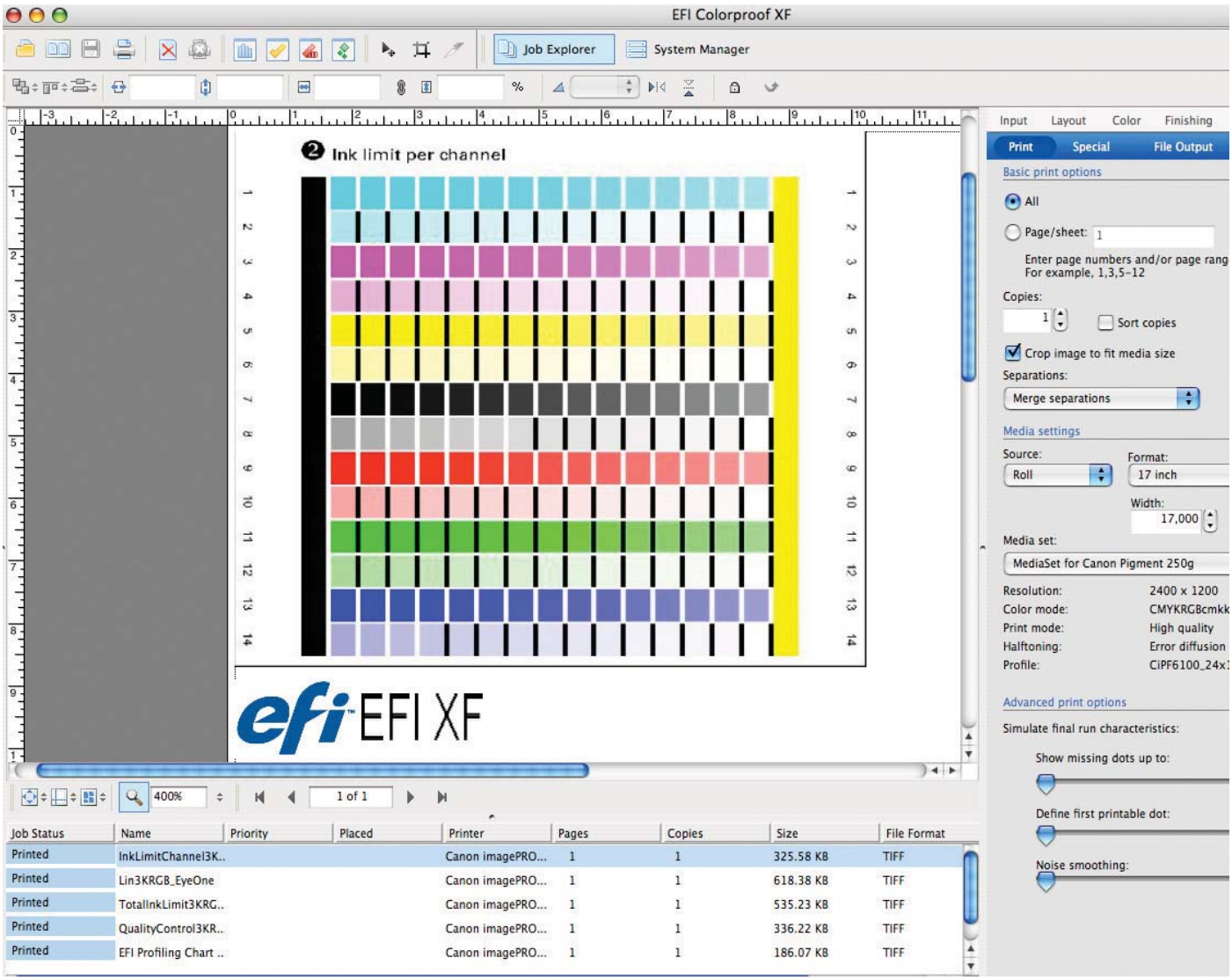
First a quick walkthrough of the major highlights in version 4 of Efi Colorproof XF. We've mentioned the support for APPE 2.0, but there is more. In version 4 the previously announced Dynamic Wedge technology is implemented, which means that key colours on the page can be included in the control strip. If the printer has a built-in spectrophotometer this control strip (the Dynamic Wedge) can be verified automatically, and the result can be printed onto the proof.

One of the standards that Colorproof XF can verify against is the new ISO 12647-8, called validation proofs. This is an ISO-standard aimed mainly at digital presses that may produce matching print according to, for example, the print standard ISO 12647-2, but not necessarily according to the more strict contract proof standard ISO 12647-7. But with a suitable colour printer the Efi Colorproof XF v4 can produce accurate proofs according to the very demanding ISO 12647-7, which we have shown in previous tests, and also managed to repeat in this test.

High-end RGB-output

But back to our specific objectives for this test – could we reproduce a series of high gamut RGB images with high accuracy, in part thanks to the new and enhanced calibration procedures in Efi Colorproof XF v4? We decided to use one of the wide gamut 12-colour inkjet printers on the market, the Canon iPF 5100. The conventional CMYK colours are complemented with special Red, Green and Blue inks, as well as several different sets of grey and black ink. All in all this means we can produce roughly a 200% larger colour gamut than with high-end offset printing.

But will the visual appearance match Adobe RGB on a high-end monitor? Large colour gamut is important, but not the only factor to influence the end result. Equally important is a smooth rendition of the tones, especially



One of the crucial steps in calibration is correct linearisation, including determining the correct ink amount for that substrate. In Efi Colorproof this is a 5-step process, looking at all the colorants in the particular printer. Here we see the seven major colourants for the Canon iPF 5100 inkjet printer used in the test.

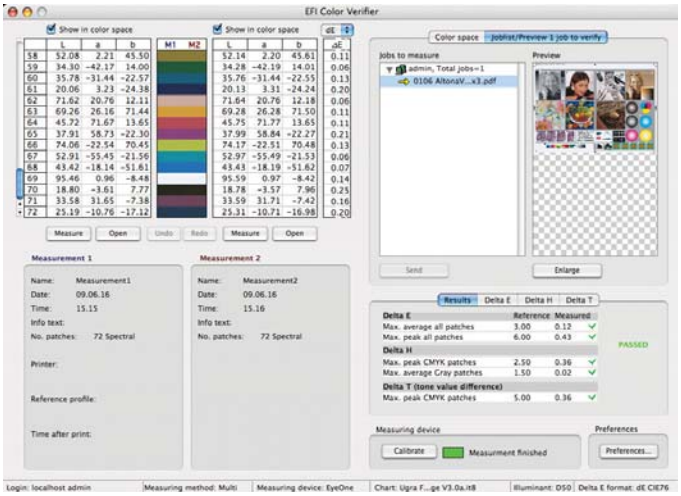
in shadow and highlight areas. A colour accurate reproduction of the saturated colours is also important, while maintaining subtle nuances in those saturated areas. This is where many RIP systems fail – the colours are saturated, but tone differences are flattened out.

In Efi Colorproof XF, calibration (including linearisation) is a 5-step process, followed by the creation of the ICC profile. This is where a built-in spectrophotometer comes in handy, but on the iPF 5100 this is not the case – we had to use the handheld X-Rite EyeOne Pro instead. As of now, Canon doesn't have any plans to add built-in spectrophotometers to its inkjet printers, not even the wide gamut high-end version. We think Canon should reconsider this decision, but on the other hand you shouldn't need to create new profiles for your printer that often – a re-linearisation should be enough, and the later version of the iPF 5100 has a built-in densitometer, which is adequate for the job.

A crucial moment is when the correct amount of ink is to be decided on. Depending on substrate, the ink should dry within seconds, or at least within a minute or so. If the ink isn't dry within, let's say, 60 seconds, you will run into all kind of problems, such as smearing, but also bronzing effects and you may get very different colour characteristics than expected. In this case, dry ink means dry enough not to smear – it takes at least 1 hour, and in some cases up to 24 hours, before the spectral readings of the printout have fully stabilised. But for practical

reasons it's probably enough to wait at least 20 minutes after printout before measuring the test charts, except for the test chart used for evaluating ink amount. This print should be inspected immediately after printout in order to detect patches that bleed too much ink.

It took us three tries before we were satisfied with correct ink settings, but from there it was quite straightforward to create an ICC-profile. Efi Colorproof has a built-in colour management toolbox that includes ICC profile creation. In this case we used the 'Multicolour chart' mode, since the printer is a CMYK-RGB capable printer, and we wanted to use the whole gamut possible in the printer.



In a high-end proofing system the contract proofs can't be sent off without first being measured and verified. The Efi Colorproof can use a range of control strips for verifications, including EFI's own Dynamic Wedges. Here the UGRA/FOGRA media wedge is used, as included in the ECI Altona Test Suite.

It was with great satisfaction that we concluded that the prints of our series of photos were a very, very close match to what we saw on the monitor. We used a JUST Normlicht viewing booth set to approximately 1500 Lux to match the Adobe RGB images viewed on a Samsung XL 20 LED backlit monitor set to D65 and 160 cd/m2 luminance. This means a difference in whitepoint (the viewing booth uses D50), but with that taken into account, the prints matched the digital originals viewed on the monitor very, very well. This is the first time we can conclude that it's possible to reproduce a high gamut image more or less perfectly in print. This is, of course, highly dependant on which printer you use, but almost as important is what RIP you drive it with. We will continue to test more RIPs, but it's clear that the Efi Colorproof XF v4 is one of the references in performance that they will be judged against.

– Paul Lindström