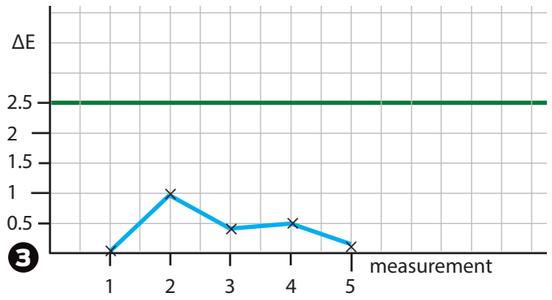
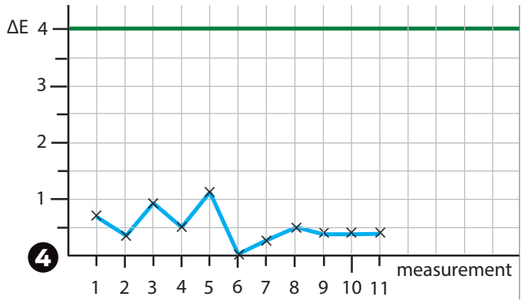
TEXT PAUL LINDSTRÖM pl@digitaldots.org

TEST RESULTS





RESULTS IN NUMBERS.
Since the RISO ComColor 9150 only prints on uncoated stock we compared the colour gamut with that of offset on uncoated (plain) paper as well. For offset the colour gamut is around 172,000 colour when using a standard ICC-profile based on the characterisation data set called FOGRA 27. On the 9150 we reached 187,000 colours, so actually a slightly larger colour gamut than for offset.

The resolving power, where distinct line pairs could be seen, was 300 dpi, exactly what is promised in the technical specification. The small text was clearly reproduced down to 4 point, definitely the positive text and also the inverted text with white on black background, but here the white text was a little clogged up by the surrounding black areas, but still readable.

Regarding uniformity the ComColor 9150 showed a maximum deviation across the page of 1.0 fjE (and an average of 0.4 fjE). A colour deviation below fjE 1 is impossible for the human vision to detect, so the results for the 9150 has to be said to be more than satisfactory in terms of good uniformity.

What about variation? Well, here the 9150 perhaps surprised us even more. The colour variation over the print run was maximum 1.2 fjE (and an average of 0.5 fjE), which again has to be said very good, meaning low. It is well under 4fjE, and close to 1fjE, which can't be detected.

Regarding printing speed we clocked the ComColor 9150 to produce exactly 150 pages per minutes, exactly according to specification.

Finally the register in duplex mode was judged to be satisfactory, under +/– 1 mm in average in the four corners of the page.

CONCLUSIONS.
The oil based pigmented ink in combination with true 300 dpi output with 8 grey levels offer both a good colour gamut, and smooth tone reproduction. While 300 dpi would be seen as a bit too low resolution on a toner based system (no grey levels), RISO achieves a somewhat surprising good image quality in the ComColor 9150, especially using the new ink formulation on the X1, which has reduced see-through while improving the density of the black ink.
As can be seen on the output sample of small text, the 4p font is reproduced sharp and clear. Since we deal with output on uncoated stock, the structure of the paper itself doesn't support much more than the equivalent resolution of true 300 dpi. While many printer manufacturer present a much higher addressable resolution in the technical specification than can be delivered as real resolving power, RISO deliver exactly what they promise – the stated addressable resolution is also the resolving power, which is the native resolution of the printheads. This to us means that the ink droplets are put down with very high accuracy, and bond well with the paper.

So with all this praise, isn't there any room for improvements? Well, actually there is no particular area where we can see any serious limitations. There is a 1-3 mm white border on the page, but this is true for most digital printers. For pages with bleed a larger paper needs to be used, and for booklets or books with many pages the creep of the paper needs to be trimmed for thick book blocks, but this isn't unique for the 9150,

This mean that for most types of the print production, the RISO ComColor should be a fast and relatively cheap (and economical) printer, which offer an image quality similar to that of conventional offset on uncoated papers. RISO estimates that the cost of the oil based ink, the actual usage, is about half of that of most toner based systems in the UK, so this will have a real impact on the total cost of the prints. The relatively low power consumption, stated by RISO to be 0.15 Wh per sheet, will also contribute to a favourable cost calculation, as well as give a low CO2 emission value. We are impressed!

agi GRAFISKT FORUM
För dig som publicerar & producerar information
499 | November 2013 **| 150 kronor**
EXTRA

Independent Product Test of Riso ComColor X1 9150

"The RISO ComColor X1 9150 should be seen as a serious challenger to the perhaps more well-known players in the industry"

TEXT PAUL LINDSTRÖM pl@digitaldots.org

RISO COMCOLOR 9150

The new RISO ComColor 9150 is a 150 ppm inkjet based digital colour printer which prints up to 340mm x 550mm size paper from the standard tray. The colour gamut and image quality is equivalent to that of offset on uncoated paper.

RISO Comcolor 9150

Marketed as the world's fastest sheetfed colour printer, the RISO ComColor 9150 should be seen as a serious challenger to the perhaps more well known players in this field within the industry. But since RISO is a bit humble in the way they present this printer and have not focussed on the higher volume market, they have stayed under the radar in a way. So while the printer is best known for use in office environments and in-house corporate print centres, it is also ideal in a production print environment. As we will see, our tests show that this printer actually deliver a colour gamut and image quality at or above that of litho offset on uncoated paper. And the speed? An impressive 150 single sided pages per minute!

The RISO ComColor 9150 is very compact thanks to the simple paper path and slim design of the array inkjet print head. Because this is an inkjet based machine, not toner based. This is both the secret to the speed, and the low power consumption. The paper comes out cold, and the ink is instantly dry thanks to the oil based pigment inks. The paper doesn't need any special coating like most dye- and water based inkjet inks, and another benefit from the oil based ink is that the image doesn't smear if in contact with water or humidity.

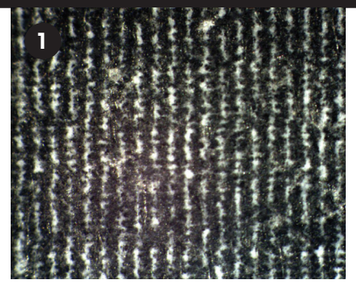
Thanks to the compact design the footprint can be kept very small even if optional equipment is added to the ComColor 9150, like stapling, punching, folding or binding.

Another option is the High-capacity feeder, in which you can load 4000 sheets of paper, and also fill up paper without interrupting the print run. In consequence there is also a High capacity stacker to match this. Another option is to install a scanner onto the printer, making it into a colour copier or Multi Function Printer.

The ComColor 9150 can print A4 or A3 when fed from the Lower Feed paper trays, or up to 340x550 mm from the Standard Feed Tray. The paper can be from 46 gsm to 210 gsm plain (uncoated) paper when fed from the Standard Feed Tray, and between 52 gsm and 104 gsm when fed from the Lower Feed trays. The resolution is 300x300 dpi, with output modes for 300x600 dpi and 300x600 with smoothing. The printheads offer 8 greyscale levels, and work according to the Piezo technology.

RISO offer three options for output drivers, or RIPs. The first is basically only using the printer driver functions and the GDI (Graphic Device Interface) rendering engine, which will take most users a long way offering functions for booklet printing, FM-screening and more. The second option is to use a Postcript RIP, and here there is actually two version – either the basic ComColor Express IS 950C, or the bigger and more powerful IS 1000C with functions for forms printing and variable data production, including support for PPML. The third option is a IPDS printer controller, with support for the IBM AFP page description language. This is typically used for variable data production including transactional data processing and integration with corporate business systems.

TEST RESULTS



1. RESOLUTION.
In the resolution test, the RISO ComColor 9150 showed identifiable line pairs up to the equivalent of 300 dpi, in the horizontal direction, and the same in the vertical direction. Shown here is an image of the sample as seen using a digital microscope at about 500x enlargement.

2. SMALL TEXT.
The ComColor 9150 could reproduce four point text well, especially as black on white background, while the inverted white on black got a bit thin. Shown here is an image of the sample as seen using a digital microscope at about 500x enlargement.

3. UNIFORMITY.
When measuring in all five samples of solid Cyan across the height of a A3 sheet, the uniformity of the ink density was very good. We use a threshold of 2.5 fjE, as suggested in the ISO 12647-2 standard, when printing solid spot colours. Any colour deviation lower than 1 fjE is invisible to the human eye. The first sample is compared with itself, so will give a zero colour deviation.

4. VARIATION.
When measuring a colour sample for every 25 copies printed in a print run of 250, the colour variation was very, very low, which is excellent. We use 4 fjE as the tolerance, as suggested in the ISO 12647-2 standard. Any colour deviation lower than 1 fjE is invisible to the human eye. The middle sample, number 6, is compared with itself, so will give a zero colour deviation.

HOW THE TEST WAS MADE.
When we test digital printers we look at in all six areas, with references when possible to established ISO standards for conformance. The first area is what colour gamut can be achieved, and since there is no ISO standard for digital printing, we compare with the 12647-2 standard for litho offset. We measure colour gamut by creating a standard CMYK ICC profile from a IT-8 characterisation chart data. This is done using an X-Rite i1 Pro spectrophotometer and professional profiling software. The profile is then analysed with the Chromix ColorThink Pro software to yield a figure for the total number of discrete colours contained within the gamut. We define discrete colours as separated by a delta-E value of 1, using the CIELab colour space as reference.

The second area tested is what resolution can be achieved. We call this the resolving power of the printing system, and this is often different than the stated addressable resolution, as per the technical specification. The resolving power is a combination of the native resolution of the print heads, droplet size (or toner particle size) and mechanical precision when moving the print heads and/or media while printing. To measure resolution we viewed the prints of a test chart with the line pairs chart under a digital microscope. We want to determine the point at which the lines could no longer be differentiated as distinct pairs. As a complement to the line pair chart we also print text, both positive black on white and inverted white on black, in a small font (down to 4p). This is another way to judge what resolving power the printing system have for practical use.

The third area is to evaluate how uniform the print is across the paper surface. We take five measurements of full tone cyan and then use the software SpectroShop to compare the colour deviation between the first sample and the other four. As a threshold we decided on 2.5 fjE, the same value suggested in the ISO 12647-2 standard for when printing solid spot colours and expect a close match.

The fourth area is to check colour variation of a print run. For this we printed a short run of 250 copies and pulled samples at every 25 copy, and included the first print. We then use the sheet in the middle of the print run as reference, and compare the colour for the other 10 copies with this. Again we refer to the ISO 12647-2 print standard for tolerance on this, and set it to be a maximum variation of 4 fjE.

The first area tested is the printing speed. We print at maximum speed for at least 2 minutes and compare the achieved number of ready pages with the specified pages per minute.

Last but not least we check the registration between front and back of a page in duplex mode. Again there is no directly applicable ISO standard defining the tolerances for this, but we use the postpress standard ISO 11800 as a guide here, and the tolerance for different register issues is often define to be +/– 1 mm.

GRAFISKT FORUM AGI 499 NOVEMBER 2013