THE LUMINOUS LANDSCAPE – PRO-2000 Review

Mark Segal

https://luminous-landscape.com/canon-pro-2000-review-and-related-items-of-interest/

Canon Pro-2000 Review and Related Items of Interest

This article is more about the related items of interest than about the printer itself, though they are intimately connected. I say this because the printer has already been well-reviewed (Keith Cooper, NorthLight Images, and Scott Martin, Onsight). As well, Marcin Kaluza has written a number of insightful contributions on the new line of Canon printers responding to various topics in this website's Forum. Hence I shall expend much less space on what has already been said, but rather consider this an experience report on the underlying and cooperating factors that give rise to the excellent prints that the Canon Pro-1000 and Pro-2000 are capable of delivering. I would like to acknowledge from the outset the very generous commitment of time, materials and insight that staff members of Canon Canada, Canon USA and Canon Inc. (Kanagawa, Japan) have contributed, enabling me to write this article, always based on the principle that I remain in charge of what I say here.

I initially thought this would be an easy article to write because I had already written a review of the Pro-1000 for this website and Canon said the print head and the inkset are the same for the whole new line of Pro-1000, Pro-2000 and Pro-4000 printers. So the key issues I like to focus on (because they are fundamental) – print quality and printing accuracy should be "no-brainers" having "done it all" once already. Well, yes and no. This turned out to be more challenging than I expected because technical factors other than ink and print head upset the expectation of sameness across the board. We'll get into that, but I'll say up-front I am reporting on these processes and experiences especially because I think the issues I encountered and their solutions could be useful to others, and could elicit constructive conversation on this website about causal factors that are beyond my expertise.

Firstly, however, I would like to briefly summarize my key observations about features of this printer that stand out in my mind.

I participated in setting up the first Pro-2000 that Canon Canada received, in their printer lab, at the time located in Mississauga Ontario. I was impressed with the ease of assembling the stand (Figure 1) and print receptacle basket (which can be set in five different positions) – the only "tough" part being the four guys needed to displace the printer onto the stand (Figure 2). Yes, it weighs a bit – as expected for an apparently robust piece of machinery like this.

The printer's ability to handle two rolls of different paper sequentially (Figure 3) without the user needing to recharge the rollers each time provides a real efficiency boost when working back and forth between a pair of papers, as we did quite often during the testing work. The user registers the media type for each roll in the printer LCD menu; thereafter when selecting that media type in the driver for printing, the printer knows from which roll to draw the paper.

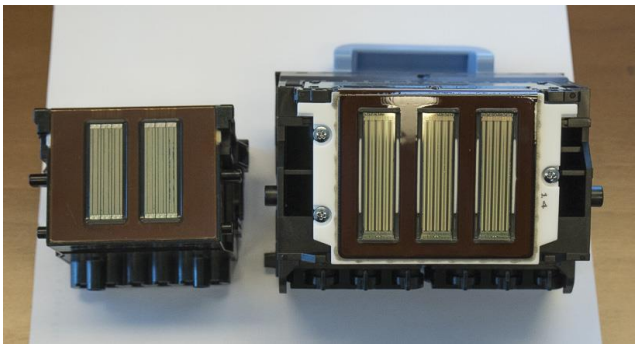
The footprint of this machine considering the 24-inch carriage width is the smallest that's been designed for this size carriage that I've seen. The width is only wider than the carriage by the amount needed for the transport mechanism. This was made possible because the ink tanks are positioned top-back rather than on the sides. The depth is shallow enough to wheel the printer through a standard North American doorway (Figure 5).

While on the subject of ink tanks, I especially appreciated that each tank has its own sub-tank filled with ink. When the principal tank is empty, printing doesn't stop. It continues using the content of the sub-tank while the principal tank is

replaced. This is a handy feature for commercial printing environments where high-productivity translates into money, and it assures that the principal cartridges are empty before being discarded – all of its ink has passed into the sub-tanks by the time it needs replacement.

Speaking of high productivity, I found the combination of Print Studio Pro and roll paper very handy for commissioning an automated sequence of prints from different photos. The software also allows for various page layouts, margins and cutting options. Once a group of photos is opened and selected in PSP and the print settings chosen, one can click Print and move on to something else. All the selected photos will be printed in the specified manner. This would be of particular interest to those using the printer in a high volume production environment

As with previous Canon printers, the print head is user-installed and user replaceable. Figure 6 shows the new print head compared with the model for previous large format models. The new models use the one larger printhead rather than two smaller ones. Canon claims this speeds processing and, along with the unibody printer construction, improves accuracy of ink dot placement. Close examination of some comparison prints Canon Canada prepared from the IPF 6400 and the Pro-2000 indicates a somewhat cleaner looking, better-defined image from the Pro-2000



Once the inks and the printhead are installed, the printer does a self-calibration (output shown in Figure 7). As for the Pro-1000, this is an automated process using sensors in the printer. It does not require user intervention to evaluate the correctness of patches in the calibration target. Canon considered that user evaluation is prone to user error so replaced it with sensors.

I also found the large LCD panel with its distinct messaging and ease of use for accessing many of the printer's functions a delight to work with.

Profiling

My next interest was in profiling quality. Why? Because good profiles are an important component to achieving good quality prints of predictable tone and colour; hence the question is whether this printer, inkset and a variety of papers are conducive to high quality, reliable profiling.

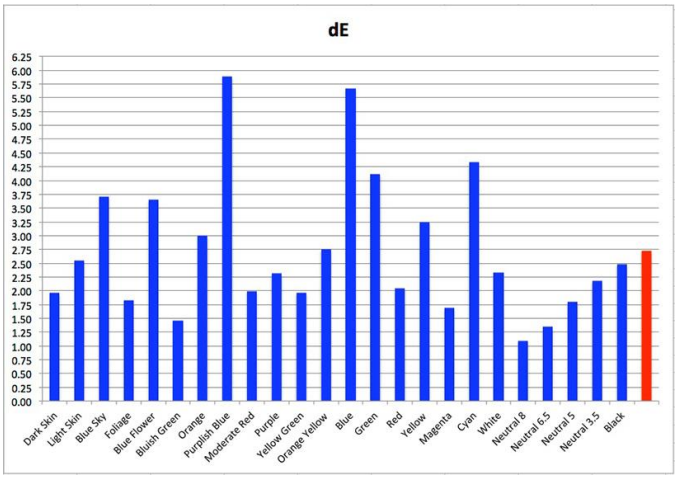
There are several layers to this:

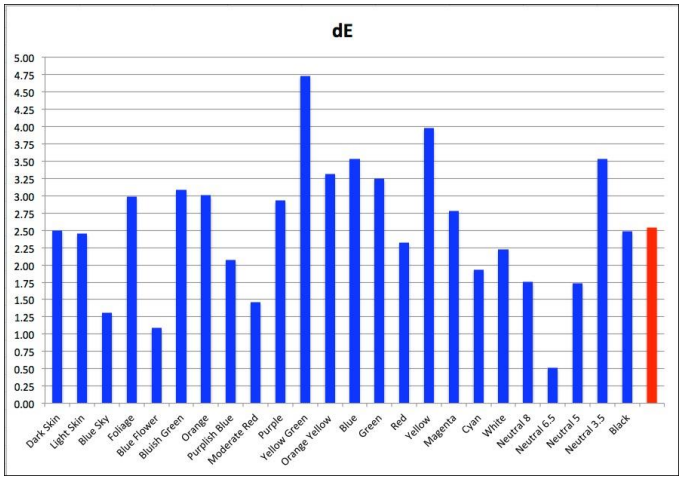
(1) How good are the profiles that the printer manufacturer provides for its own papers and this printer?

(2) Depending on the answer to (1), can I improve using Pro1000 custom profiles in the Pro2000 printer?

(3) If not, how best to create custom profiles for the Pro2000?

The first step of course, is to address item (1), which I did. The average dE(76) on my 24 patch GMCC (Gretag-Macbeth Color Checker) accuracy test image for Canon Pro Luster paper was 2.72 (Figure 8). The result with Canon Pro Matte paper was 2.54. I consider anything above average dE(76) of 1.5 an invitation for improvement. Because I did not create these profiles, my tasks were limited to printing my accuracy test target from Photoshop using the OEM profile and Absolute Rendering Intent and measuring the resulting print with i1Profiler and an i1Pro2 spectrophotometer (under M0, M1 and M2 conditions for handling OBAs), then importing the results into my Excel template for calculating the dE results. This methodology is further explained in my review of the Pro-1000 (where I also mention the caveats) so I won't repeat the details here. Suffice to remind here that "accuracy" in this context means how closely [in dE(76) terms] the Lab values of measured colour patches on the GMCC testing target printed with the relevant profile cohere with the image file Lab values for those patches.





The red bar is the average of the 24 to the left of it.

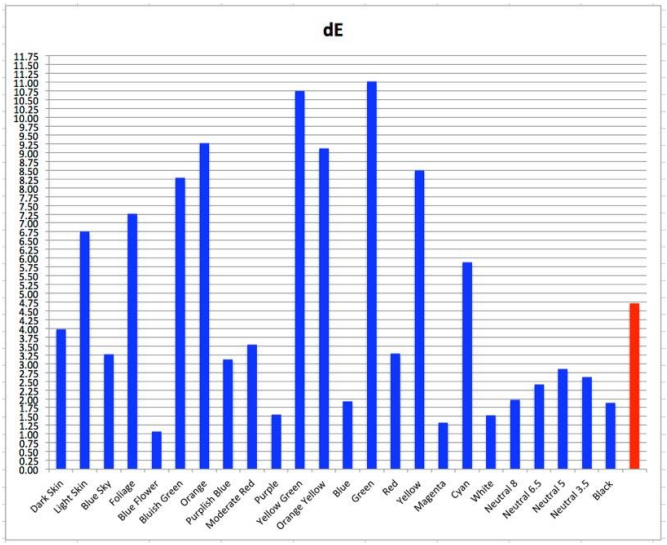
I emphasize at this point that is very often the case that custom profiles will deliver more accurate results than supplier profiles for well known reasons (e.g. different machines of the same model, different printing environment). It remains nonetheless possible and even likely that many users will find that profiles with accuracy in the range of 2 to 3 dE deliver perfectly acceptable print quality relative to their perception, taste and needs. I discuss this factor in greater detail at the end of the profiling discussion after Figure 13. The fact that I'm trying to squeeze the very best I can out of these printers with custom profiling doesn't mean that decent OEM profiles can't be used to many peoples' entire satisfaction, and the range shown here is decent. It may also be appropriate to consider the possibility that the accuracy test itself could be influenced by subtle differences between the conditions in which the OEM profiles were made relative to those in which their outcomes and accuracy are being measured, such that consistency alone would favour the statistics for custom profiles, but perhaps not necessarily differentiate the prints

Moving on to item (2), using Pro-1000 profiles in the Pro-2000:

I at first assumed that as the Pro-1000 and Pro-2000 use the same inkset and printhead, I could use custom Pro-1000 profiles in the Pro-2000, but I was disappointed. The result was even worse at average dE(76) of 4.75 (Figure 10). Obviously, the specific Pro-1000 in my studio is not equivalent to Canon's new Pro-2000 – to an extent that exceeds the expected range of variation one would expect between two units of "the same" technology. So clearly other differences between the models, not the inkset and the printhead, were at play.

Canon confirmed that these differences exist, explaining why they issued a new set of profiles with the driver for the Pro-2000. The main reason for the difference is that in order to achieve faster but equivalent quality production from the Pro-

2000, they needed to modify the manner in which the ink is laid on paper in the Pro-2000 and those changes created the need for specific Pro-2000 profiles. Bottom line: use the profiles meant for each printer model.



Moving on to item (3), custom profiling:

I merrily set-about creating a custom profile in my usual way – using the Adobe Color Print Utility (ACPU) to print the profiling targets (because colour management needs to be disabled and this utility is *supposed to do that* and always did in the past), then measuring them with my i1Pro 2 and making three profiles corresponding with M0, M1 and M2 conditions. Readers of my Pro-1000 review may recall that this worked reasonably well, achieving an average dE of 1.26 for the Pro-1000 printer and Canon Pro Luster paper. Well, sad to say, but no such good fortune repeating the same exercise with the Pro-2000. The results were stunningly unsatisfactory (Figure 11).

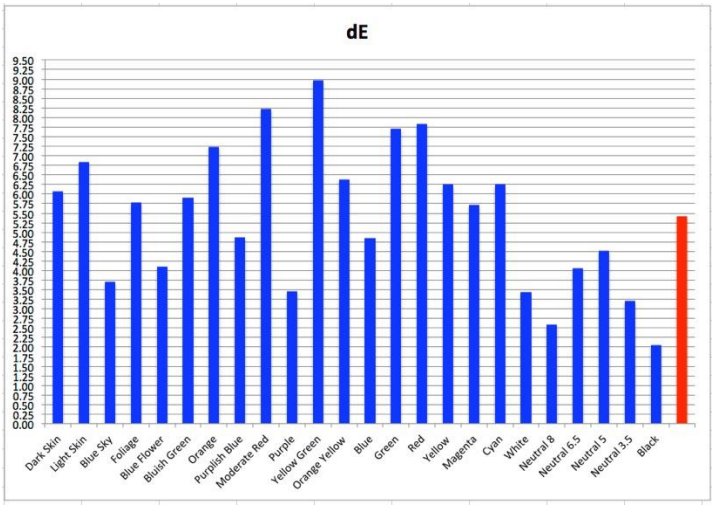
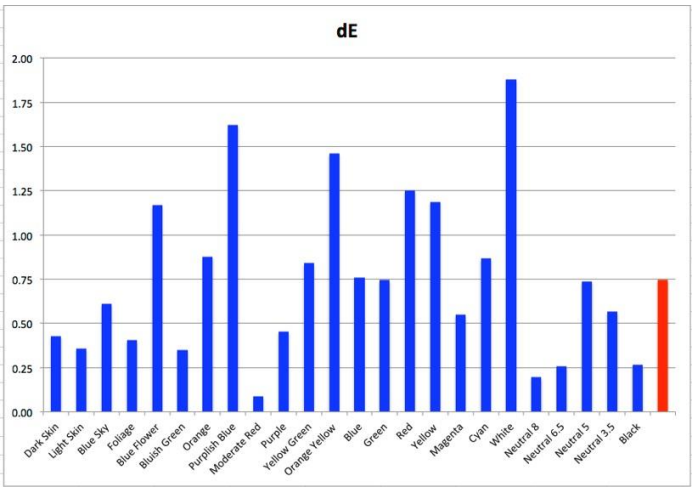


Figure 11. Mark Pro-2000. Pro Luster custom profile using ACPU

I also tested printing the profiling targets in the Pro-2000 printer directly from i1Profiler, but the results from that exercise mildly exceeded my acceptable range.

Recognizing that good profiling begins with correctly printing the profiling targets, I began to wonder whether I was committing some very basic procedural error causing this seemingly endless odyssey of unsatisfactory profiling or profile accuracy measurement. Hence, I undertook some diagnostics, going back to very familiar territory that worked well in the past – profiling my Epson P800 using ACPU and all the usual settings – but this time with Canon Pro Luster paper. The results of this exercise were excellent: an average dE(76) of 0.75 – one of my best (Figure 12). So this little excursion demonstrated several important things: (1) the basic methodology remains OK, all else equal, (2) OSX isn't playing games with me and (3) the paper I was using is amenable to good profiling.

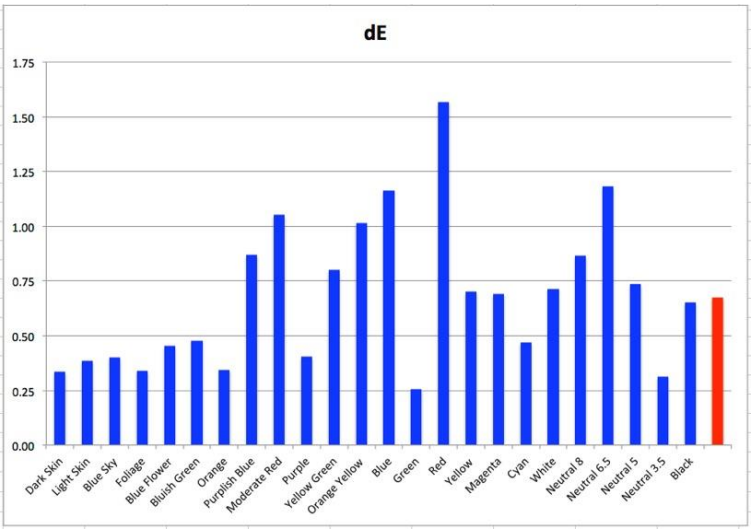


This reassured me that the methodology *can be* fine. But clearly not “all else is equal”; so “what gives” between ACPU and the Canon driver with this Pro-2000 printer? Further consultation with Canon revealed that they too had worked on this issue and they recommended I should not use ACPU for generating the profiling targets in these particular printers, but rather their own utility – Photoshop Plugin Print Studio Pro Version 2.1.0 (hereafter PSP), with the Color Mode set to “No Color Correction”. *Why* has never been clarified, this being a matter best left to the engineers in Adobe and Canon, but my basic objective was to see what works best empirically and then use it to print.

Enter a new suite of papers to work with.

By this time, Canon Canada had received their first sample packs of three new papers Canon was bringing to market: Premium Fine Art Smooth (hereafter FAS – a matte paper), Premium Fine Art Bright White (hereafter FABW – also a matte paper) and Premium Fine Art Polished Rag (hereafter FAPR – a luster-like PK paper). FAS is a paper Canon designed and is manufactured in Switzerland; the other two are other brand owners’ papers being marketed by Canon specifically for their wide-format commercial customers (24 inch rolls and upward). Much more about these papers further on. Relevant to our current topic, OEM profiles for these papers were not yet available at the time. Hence I decided to switch the profile procedural testing from Canon Pro Luster to these new papers, but adhering to Canon’s advice re Media Types and to use PSP for printing the profiling targets.

The outcomes changed like magic. I started with FAS, which has become a favorite of mine, and obtained an average dE(76) of 0.67 (Figure 13) – the best result I have ever achieved with any test since I started doing this



I then profiled FABW and FAPR in the Pro-2000, obtaining results of average dE(76) 1.03 and 0.84 respectively. Likewise, for the Canon Pro-1000, I obtained results of 1.02, 0.93 and 1.02 for FAS, FABW and FAPR respectively. All very acceptable.

The test prints I made using the Atkinson printer test page for all these profiles indicate fully satisfactory rendition of memory colours, fully satisfactory rendition of shadow detail, exceptionally rich, neutral-looking Blacks and smooth tonal gradations for all three papers in both printers.

Just as a reminder on profiling methodology for those interested, I'm using i1Profiler with an i1Pro 2, the X-Rite 2033 patch chart with scrambled patches, large tables option, V4 profile version, neutral contrast and saturation, default ambient light settings (Standard and D50), 16-bit granularity, smoothness 50, default White Point and M0, M1 and M2 measurement conditions. My operating system is Mac OSX either El Capitan or Mavericks depending on the computer in use. In general, the M0 versions of the profiles returned the most accurate results.

I provided this rather extensive (but not exhaustive) discussion of profiling because questions have arisen about how best to profile these printers, and I encountered difficulties and found solutions that I considered worthwhile sharing with the community. The bottom line is that I'm satisfied Canon's PSP Version 2.1.0 in "No Color Correction" mode combined with X-Rite professional grade profiling hardware and software provides a viable vehicle for producing highly satisfactory, reliable profiles in both printers. In fact, the statistical and the visual results are all very impressive.

Before moving on from the topic completely, this discussion leaves open one nagging issue about whether it is OK to use OEM (aka "canned" profiles) for making prints; after all not everyone has profiling equipment or wants to use a custom service. The answer to that question depends essentially on two factors: (1) how obvious are small differences of dE measurements (Lab levels) and (2) how much does it matter. I've done a fairly extensive exercise on (1) to see for myself what the practical meaning of profiling accuracy may be, while (2) is a personal matter partly depending on (1).

To very briefly summarize my findings on (1) determined on the basis of creating L*a*b* variances from patch values of a GMCC, which I may write-up one of these days, generally a side-by-side comparison of divergent L* values would show-up a difference as little as 1 level and a more pronounced difference from 2 levels onward. For the a* channel, differences of hue become more evident from about 2 levels onward. For the b* channel it can take 3 levels and onward for differences to become really obvious, but all this varies depending on the colour. It may also vary depending on the paper. I prepared one set of 24 observations using my Epson SCP800 and Ilford GFS paper. The way I configured it shows "correct" and "deviating" patches side by side. Seen in isolation, (i.e. no comparator) GMCC patches with yet wider divergences from their reference file values can still look pretty normal. So when we have profiles with average dE for 24 colours exceeding 2.0 ~ 3.0 (recognizing of course that some colours are above and others below that average difference), the general appearance of the results in a print with millions of intermingled colours may still be acceptable to a great many viewers. Therefore, I wouldn't dismiss OEM profiles out of hand just because I can achieve greater accuracy using custom profiles made with professional grade equipment and software. I just happen to be more comfortable – and perhaps it makes soft-proofing more reliable – using profiles that render image file values quite correctly.

Once average dE results begin to exceed say 2.0~3.0 the extent of the dispersion of various individual dE values around the average could become bothersome depending on the extent of the variances of each colour from the average. For example, an average could consist of 24 different dE values all quite close to the average, i.e. fairly flat bar chart shape (less likely to be bothersome), or a much more peaky shape where some dE values diverge widely from the average with all the rest being quite close to the average (the outlying colours being more likely bothersome).

So we use good profiles, whether OEM or custom, in order to make good prints with as little waste as possible, and it is here where the Canon Pro series printers really shine. In the hands of people who know how to do good photo preparation for printing they produce superb results.

But this didn't happen just by some Canon engineers tweaking the previous generation at the margins. They did a rethink of certain key aspects of printing technology from first principles. You can see the extent of the rethink from the substantial changes of the printer design and the printhead; however, rather invisible is how they changed the inkset and the laydown of ink on paper, so I should explain the bits I have been given to understand.

Scientists at Canon's R&D centers for inkjet printing technologies in Kanagawa worked on the premise that perceived print quality depends very much on high optical density in black areas (i.e. perceptibly rich, deep Blacks) and a wide colour gamut. They were also exercised by an important problem, the extent of which they measured, that the

comparative measurements of black density with spectrophotometers do not necessarily correlate well with Black shading appearance in all viewing environments.

Or put otherwise, due to certain limitations of spectrophotometers, a series of measured L*a*b* values versus the ordering of Black shades from dark to lighter reported by viewers' subjective evaluation can be inconsistent depending on the characteristics of the observation environment – particularly the colour of the walls (e.g. white, grey, or black), the position of the observer and the *relative* strength of the lighting reflected from the print as between diffuse reflection from a primary light source, versus specular reflection from a secondary light source (i.e. sub-illuminant, such as from walls of the viewing room).

They found that research results based only on spectrophotometric evaluation will not necessarily lead to predictable colour appearance impacts – particularly for the Blacks. Therefore, they needed and developed new methods – in particular a mathematical model deriving from the physics of light reflectance that would highly correlate the results of measurements (of L* and optical density) with those of subjective evaluation. Their equations were developed from data they gathered in a range of environmental and lighting scenarios using a spectroradiometer (another kind of instrument placed at the point of observation, which overcomes the limitations of spectrophotometers). Having developed these equations relating L* and optical density to colour appearance, they no longer needed recourse to the spectroradiometer and the laborious construction of physical environments to replicate each viewing condition.

Then Canon Inc. used this model for evaluative purposes in reformulating and optimizing the potential gamut provided from their inkset, one important element of which was the decision to replace the Green ink with Chroma optimizer.

Scientists in Canon's Imaging Technology Development Center and Inkjet Device Development Center in Kanagawa have written-up the development of the model in two scientific papers that Canon Inc. provided to me, along with a file of one of the test images they use for evaluating Black and colour vibrancy (Figure 14). However the specific ways in which the model was deployed for the development of the inkset are not explained – presumably that's their "secret sauce"; but whatever they did really works well – our primary interest here, and illustrated below

In particular, between the new printers, the new inkset and the new papers (FAS, FABW, FAPR) they have come closer to bridging the perceptual gap between matte and PK papers than several seasoned print viewers and I had ever seen before. As I profiled and printed with the three new papers in both the Pro-2000 and Pro-1000 printers, I made sure to print the Figure 14 test photo for purposes of comparing Black rendition and overall vibrancy between the three new papers (plus several others) and two printers. I also printed several in the Epson SCP800 (on Epson Legacy Baryta, Ilford

Gold Fibre Silk and Hahn PhotoRag Baryta), as I know readers are interested in such comparisons (Figure 15). One prints this test image of course without making any adjustments to it.

Canon Pro2000		Canon Pro1000		Canon Pro1000		Epson SCP800	
Paper	L* Black	Paper	L* Black	Paper	L* Black	Paper	L* Black
FA Pol Rag	3.60	FA Pol Rag	2.89	IGFS	2.19	IGFS	2.49
FA Smooth	13.76	FA Smooth	14.02	LegBaryta	2.24	LegBaryta	2.21
FA B-W	16.76	FA B-W	16.54	Hahn PRBar	1.95	Hahn PRBar	2.48
Figure 15A: Matrix of Test Photos in order of layout; L* of maximum Black						FA Pol Rag	1.88
(note: The lower the L* value the deeper the Black tone)							

(FA Pol Rag for the P800 is not in Figure 15)
[Paper Key: <FA PolRag> = Canon Premium Fine Art Polished Rag; <FA B-W> = Canon Premium Fine Art Bright White; <FA Smooth> = Canon Premium Fine Art Smooth; <IGFS> = Ilford Gold Fibre Silk; <LegBaryta> = Epson Legacy Baryta; <Hahn PRBar> = Hahnemuhle Photo Rag Baryta. All custom profiles.]

One blind tasting was held at the new Canon printer lab in Brampton Ontario, which has a nice combination of very even daylight and overhead indoor lighting, and the others in my living room, which has large windows allowing in generous amounts of daylight. I put two questions to the observers: (1) which sample has the deepest, richest-looking Black (the background) and (2) which displays the most colour vibrancy (the vase of flowers)? They had to look long and hard, moving around the photo layout to make sure they viewed the prints at the most revealing lighting angles they could. This in itself was telling – the answers were not so obvious as the prints appear so similar. One observer remarked that this is as much a reflection on the state of the technologies as a result of consistent, high quality profiling (so X-Rite and I will take the blame for the latter). Very much as I had expected based on my observation, for the most part, the winning paper for Black appearance was FA Smooth (recall: matte) in the Pro1000/2000, and the winning paper for vibrancy was FA PolRag or IGFS in the Pro-1000(recall: luster-like). However, they also mentioned (and I agreed) that the outcomes appear really close between all of them. One observer preferred the Hahn PRBar from the Pro1000 for both Black appearance and vibrancy, but found the FA Smooth from the Pro1000/2000 very close contenders. I found it impossible to distinguish between the **P800** and the **Pro 1000** for the FA PolRag result, where the P800 is the deepest Black by 1 L*.

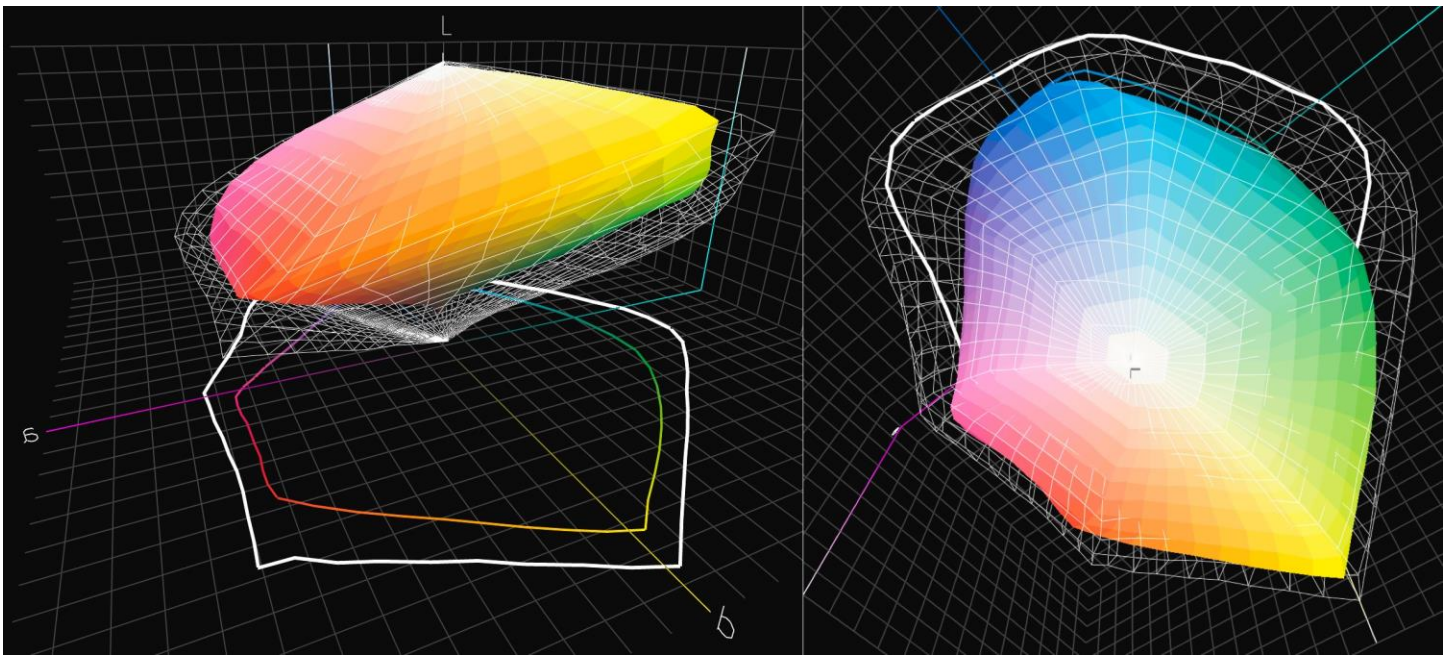
Now, when you consider that the L* values read from the Black (L*0) patch of the accuracy test page with the i1Pro2 spectrophotometer indicate L* 13.8/14 for FA Smooth and 2.9/3.6 for FA PolRag, it is clear that the value of Black assessed from subjective evaluation and that read with the spectrophotometer don't correlate – in the sense that the matte Black (FASmooth) doesn't look ten levels lighter than the luster (FAPolRag) Black as the L* values would suggest it should, making the point of the Canon scientists. Reconfirming it, the read values of Black for the Epson P800 Epson Legacy Baryta and Hahn PhotoRag Baryta were 2.2 and 2.5 respectively – both supposedly by the L* numbers a tiny bit blacker than the Canon FA PolRag in the Pro1000/2000; however appearance-wise they are very close but not blacker *looking*. So the Canon folks have done something very special with this combination of inkset and papers – getting much closer to an appearance match between the matte and luster papers, making the matte look considerably blacker and more vibrant than we are accustomed to seeing from a matte paper. I consider this to be a very significant breakthrough and was keen to move beyond targets and test pages to "real world photographs". But just before I go there, a bit more on print appearance and the new papers

On print appearance, there has been some recent conversation in the LuLa Forum about gloss differential and bronzing with the Luster/Gloss classes of papers. I found no evidence of bronzing in all the printing I've done with this class of printers. Regarding gloss differential, when Chroma Optimizer (CO) is set to "Auto" it does not coat the paper where there is little to no ink laydown, because it is mainly meant to enhance vibrancy where there is ink laydown. If I examine such prints at an absurd angle for print viewing, the surface gloss of the inked and non-inked areas appear to differ a bit. If I examine such prints at optimal viewing angles for seeing image detail, vibrancy and dynamic range, this gloss differential is not apparent; this probably because, for optimal viewing, the correct placement of the print relative to the primary lighting source and the observer would minimize surface glare and texture.

Regardless of all I said just above, the fact remains that the gamut of the luster papers still considerably exceeds that of the matte papers. This is readily apparent from the gamut volume data and profile shapes emerging from reading the profiles of the new papers in ColorThink Pro (Figures 16, 17).

	Premium Fine Art Smooth (509,713)					Premium Fine Art Polished Rag (843,818)				
Pro-2000	**R**	**G**	**B**	**W**	**K**	**R**	**G**	**B**	**W**	**K**
L	55	52	39	97	14	52	46	26	98	2
a	72	-63	34	0	1	81	-83	55	0	-1
b	57	20	-42	2	1	78	35	-73	1	2
Pro-1000			**(486,276)**					**(847,749)**		
L	55	51	37	95	15	53	49	24	97	2
a	72	-62	34	1	0	80	-84	63	0	-1
b	55	17	-44	3	2	76	38	-71	1	1

(The numbers in brackets are gamut volumes for the printer/paper combination)
Premium Fine Art Smooth and Fine Art Bright White are very similar.



The Luminance values for the FASmooth are higher than for the FAPolRag, but all the colour values are lower, accounting for the higher gamut volume of FAPolRag. Also note the L* values for Black (K) – much higher (i.e. lighter) for FASmooth than for FAPolRag, as expected. The a* and b* values for White Point and Black indicate that these papers are quite neutral in tone, the FASmooth tending very slightly warmer.

The practical meaning of all this is that in order to achieve the appearance of similar tone and vibrancy from the matte paper as is easily obtained from the luster paper, the image preparation in one's editing application will be different between the two kinds of paper; but having found the right combination of adjustments to make (which would vary by image), one can come remarkably close to luster-style Black and vibrancy appearance when printing on the FASmooth and, by the way, FABrightWhite papers. I'll show the "real-world" photographs with which I tested FASmooth below.

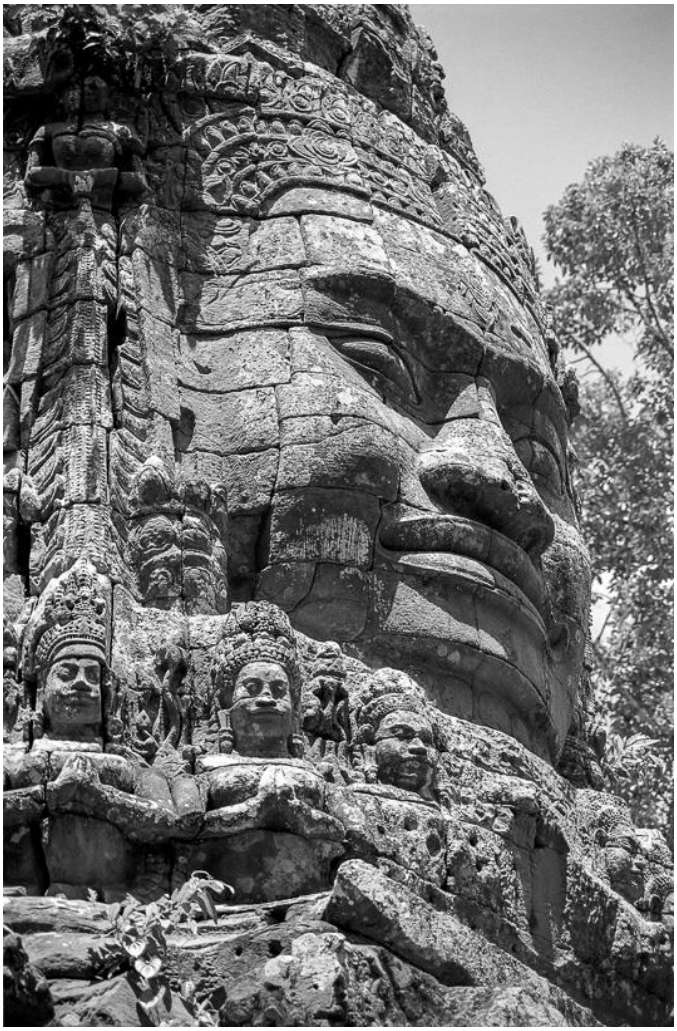
Just before going there, however, a further word on the offering and availability of the new papers. All three papers (Premium FASmooth, FABrightWhite, FAPolRag) have cotton rag substrate and no OBAs. Premium FASmooth is a Canon designed paper now in its commercial packaging and being offered in rolls and sheets. The sheet sizes for North America are US Letter, 13*19 inch and 17*22 inch. As I mentioned earlier, the other two are OEM papers being marketed by Canon but not designed by Canon. They are not being made available in sheet form, and at time of writing they are still "White Box" products with limited distribution, primarily to the commercial market. Premium FAPolRag is really a superb paper in the cotton-rag luster niche, so I am encouraging Canon to try to obtain this paper in sheet form and market it for the Pro-1000 users who can't attach rolls. It is a much richer and more robust paper than Canon's Photo Paper Pro-Luster, so it would complement their professional paper line for Pro1000 users very nicely.

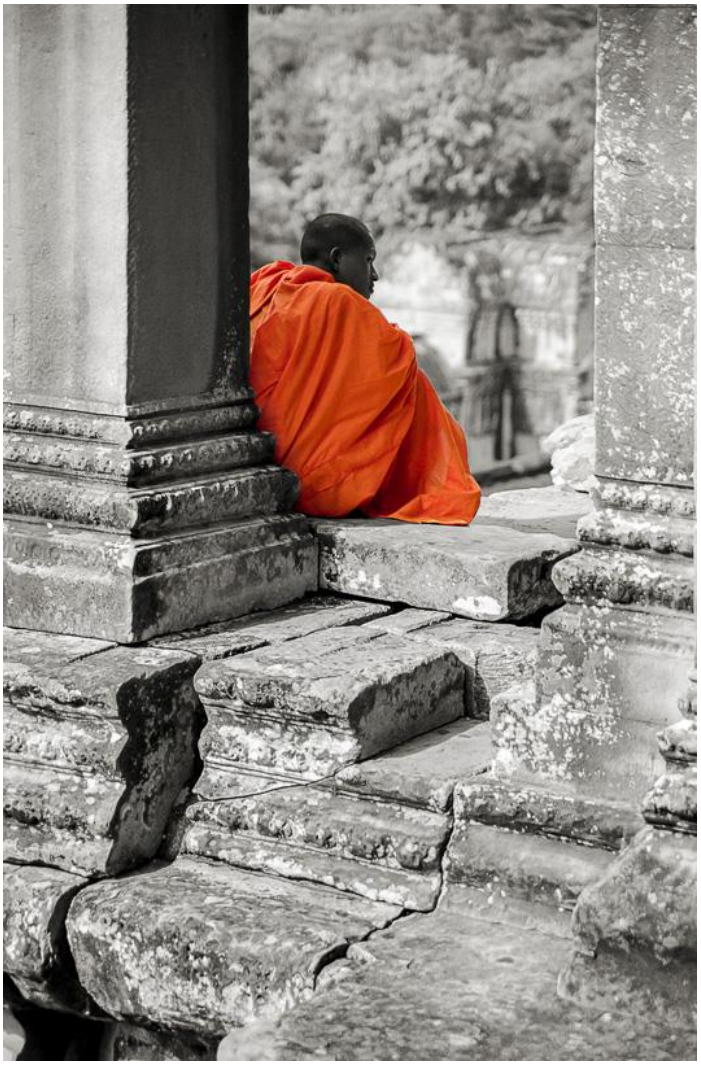
The Prints

I selected 10 "real world" photographs from my archives with which to test the quality of the FASmooth paper in this printer model line. I showed these prints to several people whose print evaluation skills are good and they were enthusiastically received. This confirmed my view that this is a printer/paper combination I would readily use again for any photos where matte treatment seems particularly appropriate, and where I want to see rich-looking Blacks and correct vibrancy.

I selected the illustrations below to see how particular properties would show in the prints

Figures 18, 19 and 20 are from film scans of photos I made at Angkor Wat and scanned in 2004. The media was Fuji Reala colour negative film, scanned in a Minolta Dimage Scan Elite 5400 scanner using SilverFast at about 4400 pixels long edge, (B&W conversion done back then with “Convert to B&W Pro” in Photoshop), resulting in 18 inch tall prints at about 240 output PPI and sent to print last week from Lightroom at 300 PPI resolution. I was looking to see how the printer would handle resolution and overall contrast at these settings, as well as the fidelity of the B&W toning in Figure 20 and the neutrality in Figure 18; it did very well. Figure 19 is a hybrid that demonstrates the printer’s versatility in colour and B&W within the same photo. I did not use the B&W mode in the printer driver or PSP, because in general I like to retain full control and predictability over the tonality of my B&W prints (i.e. soft-proofing) and in particular for this review, I wanted to see how well the regular RGB workflow could handle B&W tones and hues and variants thereof. What you see here is close to what the prints look like if your display is set to about 100~110 cd/m^2 and D50 white-point. The rendition of fine detail is remarkable. The matte paper is appropriate to the gritty feel of the subject matter.



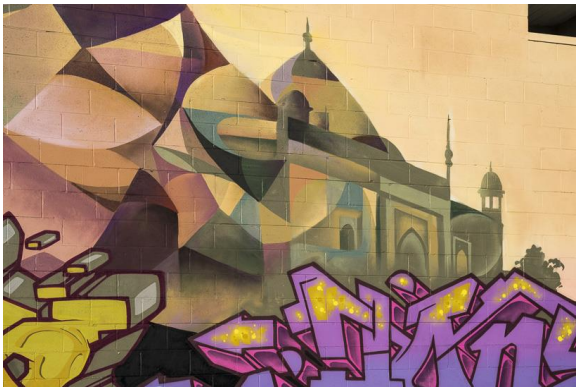


Figures 21 and 22 are from photographs I made in Easter Island several years ago with my Sony NEX 6. The intention of the colour photo is to show how the printer would reproduce memory colours such as blue sky and green grass, as well as the overall detail (particularly shadow detail) of the stone sculpture. The intention of the B&W photo (converted to B&W in Lightroom) was to show how well the printer reproduced tonal gradation in highlight to mid-tone areas, particularly affecting the billowy “feel” of the clouds, as well as the blacks and shadow detail in the lower right. This is the kind of photo that could come out muddy looking on a matte paper, but between careful LR editing under soft-proof and the quality of the printer/paper combination, it doesn’t.

Figures 23 and 24 are from Goreme Turkey and Toronto respectively. I made the Goreme photo with my Canon 1Ds MkIII and the Toronto photo with my Phase One P40+. The purpose of printing these two photos is to see how well the matte paper and printer could reproduce photos that depend on clean, high contrast impact (neutral or toned) to make the intended impression. It worked

Figure 25 is from Polson Park Pier in downtown Toronto, made with my Phase One P40+. The intent of printing this photo was to see how well the printer/paper could handle crisp detail and very natural-looking colour saturation, in particular winter-blue sky and the maroon-red on the ship, as well as the tonal relationships between the white cranes and the background. This outcome is also very satisfying.

Figures 26 and 27 are photos of a completely different genre – this is photography of graphic art (outdoor wall art in downtown Toronto), Figure 26 intending to portray strong, bright and saturated colour, Figure 27 a combination of strong saturated colour in the foreground and more subtle almost pastel hues in the background; these kind of photos can be challenging to pull off successfully on matte media. Observers and I thought the printer and paper performed very well in these respects.



I did not replicate these samples on the Polished Rag because I had previously printed them on Ilford Gold Fibre Silk and saw that given how well they worked with both the matte and GFS papers, they would be at least as good on Polished Rag. The editing in LR for luster paper requires less adjustment for tone and vibrancy relative to the editing done for matte paper, in order to prevent exaggerated contrast and vibrancy on the PK-ink media. Each different kind of media requires its own kind of image editing.

Wrapping up

In this article, I have chosen to focus on several key elements relating to overall usability and print quality. Like I found for the Pro-1000, I think the Pro-2000 is a very fine printer and **the new papers Canon has recently brought to market** are lovely. The printer looks to be of very robust construction, is straightforward and easy to use, paper feeds very reliable, no channel-sharing of Black inks, compact for a printer of its carriage width and most important of all – it makes splendid prints if the profiles are good, the paper quality is good and the photos are suitably edited. Regarding the profiling, I found the OEM profiles to be useful, custom profiling perhaps better for the super-critical and for this option, best to use Print Studio Pro for printing the targets. I appreciate how Canon's scientists went about re-examining the question of print appearance from first principles and came up with a new set of inks and papers that go a very long way to producing on matte paper the kind of tonal and vibrancy appearance we are accustomed to seeing from the luster/gloss class of papers, where Blacks rendition and vibrancy are very satisfying.