Januar 2022

## Vergleichender Testbericht des KPI-Labors

# **Canon imagePROGRAF GP-4000 gg.** Epson SureColor SC-P9500

| Vorteil ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Bildqualität | ✓ | |
| Druckproduktivität | ✓ | |
| Bannerdruck | | ✓ |
| Farbverbrauch | ✓ | |
| Funktionalität der PDF-Direktübertragung | ✓ | |
| Funktionsumfang des Geräts | ✓ | |
| Funktionsumfang des Druckertreibers | ✓ | |
| Zuverlässigkeit / Reinigungsroutinen Druckkopf | ✓ | |

# Testziel

Keypoint Intelligence hat von Canon Europe den Auftrag erhalten, vertrauliche Breitformatgerät-Leistungstests des Canon imagePROGRAF GP-4000 (44 Zoll) und des Epson SureColor SC-P9500 durchzuführen und einen Bericht zu erstellen, in dem die relativen Stärken und Schwächen der beiden Geräte hinsichtlich Bildqualität, Produktivität, Farbverbrauch, Direktdruckübertragung, Funktionsumfang des Geräts, Treiberfunktionen, Druckkopfstabilität und Reinigungsroutinen verglichen werden. Alle Tests wurden in den europäischen Testeinrichtungen von Keypoint Intelligence in Wokingham, Großbritannien durchgeführt.

# Zusammenfassung

Bei der Reprografie-Laborbewertung von Keypoint Intelligence konnte der Canon imagePROGRAF GP-4000 den Epson SureColor SC-P9500 in vielen Bereichen übertreffen. Er bietet insbesondere eine höhere Produktivität, einen niedrigeren Farbverbrauch, einen größeren Funktionsumfang des Geräts und Funktionen für die Direktdruckübermittlung. Im Hinblick auf die Bildqualität produzierte der Epson SureColor SC-P9500 Ausgabe mit einem sehr hohen Standard, die für den Postermarkt bestens geeignet ist. Der Canon GP-4000 konnte die Techniker von Keypoint Intelligence aber mit seinen extrem lebhaften und ausdrucksstarken Farben beeindrucken, durch die sich seine Ausdrucke sofort von denen der Konkurrenz abhoben. Der Anbieter schreibt dies der Radiant Infusion-Technologie zu, wonach die

Einbindung und Verwendung fluoreszierender pinkfarbener Tinte alle Farben im Allgemeinen akzentuiert, insbesondere orange und gelb, sodass sie herausstechen und leuchtend erscheinen. Ein wahrer Gewinner für alle Grafik- und Posteranwendungen. Beide Geräte verwenden Spezialfarben in ihren jeweiligen Tintensätzen, wie orange, grün und violett, wodurch sich ein breiterer Farbraum ergibt. Der Canon GP-4000 erreichte bei der Bewertung von Keypoint Intelligence den größeren Farbraum (um 1,9 %). Die Rasterbilder von Canon waren nicht nur strahlender und stärker gesättigt, sie zeigten auch wärmere, natürlicher wirkende Hauttöne und feinere Details in Bereichen mit hellem Kontrast. Das Epson-Gerät bietet einen Beschichtungsmodus mit Schwarzverstärkung, der zu einer höheren Schwarzdichte beiträgt.

Im Hinblick auf die Produktivität war der Epson SC-P9500 das schnellere Modell beim Bannerdrucktest, aber der Canon war bei der Mehrheit der Tests zur Ausgabe des ersten Ausdrucks und der Durchsatzgeschwindigkeit produktiver. Die Effizienz wird durch das charakteristische Design von Canon für den Austausch der Tintenbehälter im laufenden Betrieb (wodurch sich die Ausfallzeiten reduzieren) und eine optionale Konfiguration mit zwei Rollen gesteigert, bei der die zweite Rolle als automatische Aufwickelvorrichtung fungiert, um längere unbeaufsichtigte Arbeitsabläufe zu erleichtern. Beim Epson-Modell ist eine Aufnahmerolle als Option mit Zusatzkosten verfügbar. Schnelle und einfache Abläufe für die Medienzufuhr optimieren den Betrieb für Canon-Benutzer. Dank der integrierten Sensoren kann das Gerät nicht nur die Papierkante erkennen und Medien automatisch zuführen und laden, es kann auch Medienarten automatisch identifizieren und die verbleibenden Medien auf einer teilweise verwendeten Rolle berechnen, ohne dass ein Medien-Barcode gedruckt werden muss. Dies ist eine wertvolle Hilfe für Umgebungen, in denen mit mehreren Medienrollen gearbeitet wird. Die Medienzuführung ist beim Epson unkompliziert, sie erfordert aber einen aufwendigeren Benutzereingriff. Die Papierverfolgung über einen gedruckten Barcode wird ebenfalls unterstützt.

Der Canon GP-4000 bietet insgesamt umfangreichere Funktionen mit drahtloser Konnektivität, der Unterstützung für den Mobildruck, dem Direktdruck von einem USB-Stick und der serienmäßigen 500-GB-Festplatte. All diese Funktionen werden von Epson nicht unterstützt, mit Ausnahme einer optionalen 320-GB-Festplatte. Des Weiteren wird für alle Medien der randlose Druck unterstützt, während er beim Epson-Modell nur für ausgewählte Medienarten und bestimmte Formate verfügbar ist. Zusätzlich stellen Sensoren sicher, dass der Druck nur genau bis zur Papierkante reicht und nicht darüber hinaus. Hier kann der Epson SC-P9500 nicht mithalten. Die Funktionshighlights des Epson SC-P9500 umfassen eine interne Beleuchtungsoption für eine deutlichere Sicht auf den Druckstatus, einen praktischen, einziehbaren Medienauffangkorb für die geordnete Aufnahme von Ausdrucken in geringer Auflage mit der Druckseite nach oben und einen optionalen SpectroProofer mit Xrite ILS30 für eine erweiterte Farbverwaltung. Beide Geräte unterstützen Auftragsabrechnungsoptionen und intuitive Dienstprogramme für die Direktdruckübertragung. Das Canon-Angebot (Direct Print Plus und Professional Print & Layout) bietet aber umfangreichere Funktionen, wie die Möglichkeiten für Arbeitsabläufe mit einem Ordner für den Sofortdruck (DPP), der beim Epson-Gerät nur mit einem optionalen PostScript-Modul verfügbar ist, das mit Zusatzkosten verbunden ist. Canons erweiterte Software PosterArtist Lite bietet eine einfache Postererstellung. In diese sind jetzt drei Bildbibliotheken integriert, sodass Benutzer ein umfangreiches Angebot lizenzgebührfreier Bilder durchsuchen und diese zur Verwendung herunterladen können. Benutzer können auch Sonderfarben für Text- und Clipart-Elemente austauschen, wenn fluoreszierende pinkfarbene Tinte verwendet wird.

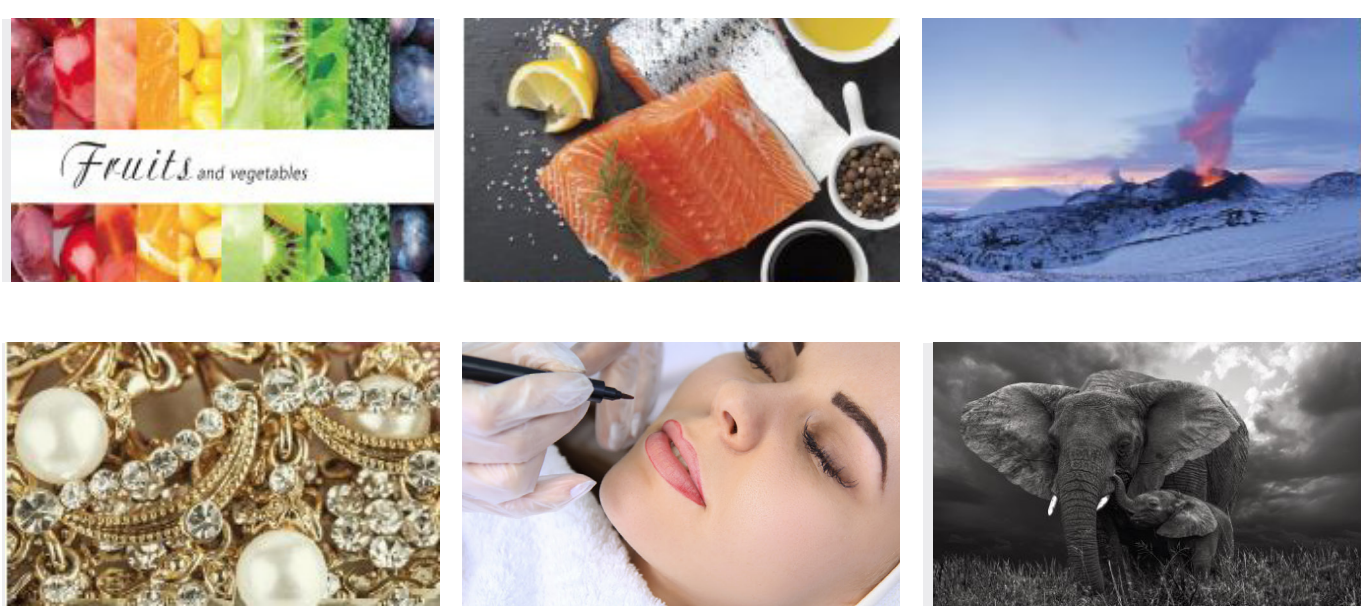
Die Druckköpfe beider Modelle funktionierten während der gesamten Bewertung zuverlässig. Beim Canon-Modell kam es zu keiner Verstopfung der Düsen, als die Drucker über das Wochenende ausgeschaltet waren, während beim Epson-Gerät eine verstopfte Düse auftrat, die daraufhin gereinigt werden musste. Zusammenfassend lässt sich sagen, dass sich der Canon GP-4000 bei der Bewertung von Keypoint Intelligence dank seiner herausragenden Bildqualität, den schnelleren Geschwindigkeiten, dem niedrigeren Farbverbrauch in allen Testarbeitsabläufen, der vielseitigeren Funktionalität für die Direktübertragung und umfangreicheren Geräte- und Treiberfunktionen hervorgetan hat.

# Image Quality

| Advantage ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Text | ✓ | |
| Fine Lines | ✓ | |
| 1x1 Pixel Grid | ✓ | |
| Halftone Range | = | = |
| Halftone Fill | = | = |
| Solid Density | = | = |
| Colour Drift across FOGRA39 | = | = |
| Consistency of three skin tones | = | = |
| Consistency of neutral grey | = | = |
| Photographic Images | ✓ | |
| Colour Gamut | ✓ | |

+, — and O represent positive, negative and neutral attributes, respectively.

Keypoint Intelligence's image quality test evaluation was conducted using Canon's Premium Semi-glossy 280gsm media and Epson's Premium Semi-gloss Photo 250gsm, using the OEM ICC media profiles with quality set to Highest on the Canon model and the Epson model set to Max Quality. Files were submitted from Adobe Photoshop application. The Epson model was tested with Black Enhance Overcoat enabled (off by default) in order to obtain comparable optimum quality.




Keypoint Intelligence's colour and greyscale halftone test targets


**Selected colour halftone test targets supplied by Canon**

+ As would be expected of a graphic arts model aimed at the high-end photographic market, the Epson SC-P9500 unit produced high quality colour output, well-suited for any poster and photo printing application. However, the Canon GP-4000 displayed a significant advantage over its competitor, thanks to the inclusion of Fluorescent Pink ink. When employed, the effect of having FP ink mixed in with the other standard colours resulted in printed output that exhibited brighter, ultra-vivid colours. Canon calls this effect 'Radiant Infusion' technology, and it's clearly an attractive benefit for any poster application. Poster examples printed on both the Canon and Epson models are provided below.

+ The Canon model produced cleanly formed, pin-sharp sans serif fonts that were fully formed down to the 3-pt. type size, with no bleed observed and rated excellent. Serif fonts were legible down to 4-pt. with some slight bleed and rated very good. The Epson SC-P9500 delivered text that was, by and large, legible down to the smallest 3-pt. size; sans serif text was rated very good and serif characters rated good on account of being less distinct and crisp than that produced by the Canon unit.

+ Fine lines produced by the Canon model were slender and consistent at the 0.1-pt. level, with some slight bleed and rated very good. The Epson SC-P9500 delivered 0.1-pt. fine lines that were virtually indistinguishable from 0.25-pt. fine lines and exhibited some ink bleed.

+ Circles produced by the Canon GP-4000 were relatively smooth and distinct and were judged very good at the 0.1-pt. level. In contrast, the Epson SC-P9500 produced dark, bold circles at the 0.1-pt. level that were jagged and matched the same thickness as its 0.25-pt. circles, hence only rated fair.

+ The Canon unit produced excellent and clean CMYK 1x1 pixel grids, with no quality issues. The Epson model produced incomplete and fuzzy CMY 1x1 grids and a black-on-white 2x2 grid with inconsistent dot formation and so rated only fair.

O Both models delivered colour and black halftone output across the full range—from the 10% to the 100% dot-fill levels—with distinct transitions between all levels.

O Both models delivered an impressive range of halftone fills in colour mode, with no banding or graininess issues. Neutral greyscale halftone coverage was equally excellent from both units.

O The Canon GP-4000 produced higher magenta and yellow optical densities, while the Epson SC-P9500 had higher optical densities for cyan and black.

O Neither model had a clear advantage in the production of three different skin tone colours, with the Canon delivering a fractionally higher drift in two of the three tests, but the Epson SC-P9500 yielded a larger drift result in the skin tone 3 test.

O Neutral grey consistency was maintained by both models, with a low variance across the page indicated by low Delta E values.

O During Keypoint Intelligence's colour drift analysis, in which the FOGRA39 media wedge is printed before and after productivity and ink consumption tests, and measured using EFI Color Verifier software, both devices displayed the same low (0.4) mean Delta E drift.

+ When printing on semi glossy media in highest quality settings, the Canon GP-4000 delivered a larger (by 1.9%) colour gamut—900,896 CIE volume versus 884,323 CIE volume for the Epson model.

+ Keypoint Intelligence technicians analysed a wide range of colour and greyscale images output by both devices and found them to be of an exceptionally high standard. Output from the Canon GP-4000 was judged to be stronger in a number of areas, however. Specifically, it exhibited brighter and richer memory colours, sharper fine detailing in highlights, more lustrous metallics, and smoother, warmer skin tones, which made them slightly more natural looking than those produced by the Epson model. Both devices delivered equally excellent greyscale photographic-like halftones with true neutral grey tones, very good depth of field and no graininess, but Canon's image had better, sharper fine detailing and textures in light contrast areas.

## Supplementary Image Quality Testing


Epson SureColor SC-P9500 Canon GP-4000

Both devices include orange, green and violet amongst their respective ink sets, with the Canon model offering fluorescent pink ink, too. As FP ink both absorbs and emits light, its inclusion enables the device to use a different colour table to generate brighter, more vivid colours overall, what Canon terms 'Radiant Infusion'. This is illustrated by the poster output shown above: when viewed side by side under natural lighting, Canon's poster has punchier colours, with brighter oranges and yellows, compared to colours on the Epson poster, which, while very good, appear darker and flatter.


Epson SureColor SC-P9500 Canon GP-4000

Under UV light conditions, the Canon poster is far more effective and striking than Epson's output. In particular, the tonal detailing on the yellow moon is clearer while the orange pumpkins are luminous, and the colours are more vivid, overall.


Canon GP-4000 with FP ink  Canon GP-4000 without FP ink

Keypoint Intelligence's technicians compared two types of poster output from the Canon to assess the visual impact of employing fluorescent pink. The poster on the left has been printed with fluorescent pink and is brighter than the poster on the right, which has been printed without fluorescent pink.


Epson SureColor SC-P9500  Canon GP-4000 with FP ink

The pink colours on the Canon poster are clearly brighter than that on the Epson output, showcasing Canon's advantage with its fluorescent pink ink. That said, one design consideration is Keypoint Intelligence technician's noted that the smaller reverse text was more legible on the Epson poster, given its overall darker background.


Canon GP-4000 with FP ink


Epson SureColor SC-P9500

Both devices include orange, green, and violet inks, and their respective posters are comparably bright and smooth. However, Keypoint Intelligence technicians observed that the Canon poster (left) has richer orange, green, and purple hues owing to the effect of Radiant Infusion.

## PANTONE Colour Matching

### Canon imagePROGRAF GP-4000

| PANTONE Colour | 165 C Home Depot | 2685 C Cadbury | 285 C Walmart | 123 C McDonalds | 485 C Coca Cola | 321 C Siemens | 293 C IKEA | 109 C IKEA |
|---|---|---|---|---|---|---|---|---|
| ▲E00 | 4.2 | 9.3 | 5.3 | 3.5 | 3.0 | 2.3 | 15.3 | 2.9 |
| PANTONE Colour | 137 C Veuve Clicquot | 279 C Microsoft | 574 C Harrods | 361 C FedEx | 476 C UPS | RHOD RED C T-Mobile | 294 C Ford | Average ▲E00 |
| ΔE00 | 5.1 | 2.7 | 4.2 | 2.7 | 5.4 | 4.3 | 13.9 | 5.6 |

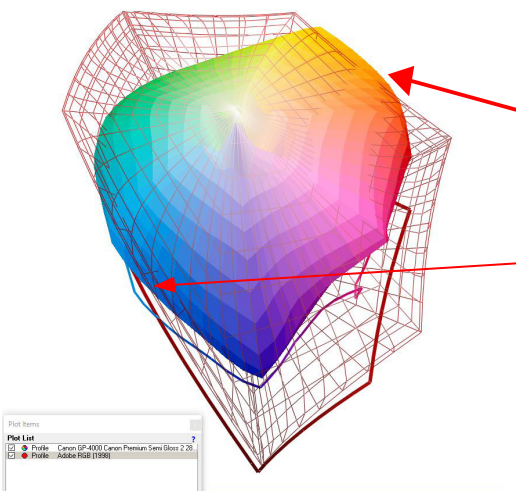
### Epson SureColor SC-P9500

| PANTONE Colour | 165 C Home Depot | 2685 C Cadbury | 285 C Walmart | 123 C McDonalds | 485 C Coca Cola | 321 C Siemens | 293 C IKEA | 109 C IKEA |
|---|---|---|---|---|---|---|---|---|
| ΔE00 | 7.8 | 11.1 | 4.5 | 4.9 | 5.0 | 4.0 | 13.9 | 3.7 |
| PANTONE Colour | 137 C Veuve Clicquot | 279 C Microsoft | 574 C Harrods | 361 C FedEx | 476 C UPS | RHOD RED C T-Mobile | 294 C Ford | Average ▲E00 |
| ΔE00 | 6.4 | 3.9 | 4.0 | 3.0 | 4.4 | 6.0 | 11.7 | 6.3 |

*KPI test target printed from Adobe Photoshop and using the ICC media profile and perceptual rendering intent with color management disabled in the printer driver. The delta E00 variance is measured using a calibrated X-Rite eXact spectrophotometer. The Epson model was not tested with its optional spectrophotometer installed.*

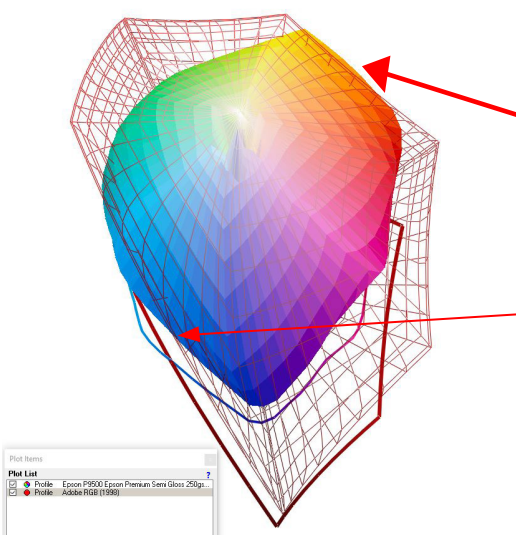
+ The Canon GP-4000 delivered the better colour accuracy and colour matching results, with a 5.6 mean Delta E00 variance across the PANTONE test targets versus 6.3 for the Epson model. Six out of the 15 corporate colours measured less than 4.0 Delta E00 compared with three for the Epson SC-P9500, with red, yellow and green corporate colour matching being particularly strong. More difficult-to-match corporate logo colours such as purple (Cadburys) and the dark blue brand colours proved to be challenging for both devices.

## Colour Gamut Cubic L*a*b Unit Volume vs. AdobeRGB
### (images created using Chromix ColorThink Pro software)



Canon has a larger colour space in the yellow-orange regions, and has an clear advantage in the green-blue colour spectrum

Canon imagePROGRAF GP-4000 colour gamut on premium semi-glossy 280gsm Highest setting compared against AdobeRGB(1998) colour space (wireframe)



Epson shows a marginal advantage in the orange spectrum, while its advantage in the lighter blue regions with the inclusion of light cyan in its ink set is better illustrated here

Epson SureColor SC-P9500 colour gamut on premium semi-gloss photo 250gsm Max Quality setting compared against AdobeRGB(1998) colour space (wireframe)

# Print Productivity

| Advantage ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| First Print Out From Ready State Portrait Printing | ✓ | |
| First Print Out From Ready State Retail Poster Printing | ✓ | |
| Throughput Speed A1 Portrait Printing | ✓ | |
| Throughput Speed A1 Retail Poster | = | = |

Productivity evaluation is based on Standard/Speed, High/Quality, and Highest/Max Quality modes.

+ When printing a single high-resolution portrait from ready state, the Canon GP-4000's first-print-out times were faster than the Epson SC-P9500 in all tested modes. In Standard/Speed, the Canon GP-4000 was 20.9% faster; in High/Quality it was 20.5% faster, and it was 35.7% faster in Highest/Max Quality mode when compared with the Epson model.

+ When printing a single medium-resolution retail poster from ready state, the Canon GP-4000's speed was faster by 17.1% in Standard/Speed mode, but 35.1% slower in High/Quality mode; it was 35.0% faster in Highest/Max Quality when compared with the Epson device.

+ In Keypoint Intelligence's A1 throughput speed evaluation, the Canon model had the faster per-page speeds, overall. When printing five copies of a single-page A1-size high-resolution portrait test document in Standard/Speed mode, it was 21.3% faster than the Epson model. In High/Quality mode, the GP-4000's per-page speeds were 16.7% faster, and 32.3% faster in Highest/Max Quality mode, when compared with the Epson SC-P9500.

O Results were more mixed when printing five copies of a single-page A1-size medium-resolution retail poster test document. Both models' per-page speeds were comparable in Standard/Speed mode; in High/Quality mode, the Canon GP-4000's per-page speeds were 54.5% slower, but 32.6% faster in Highest/Max Quality mode when compared with the Epson SC-P9500.

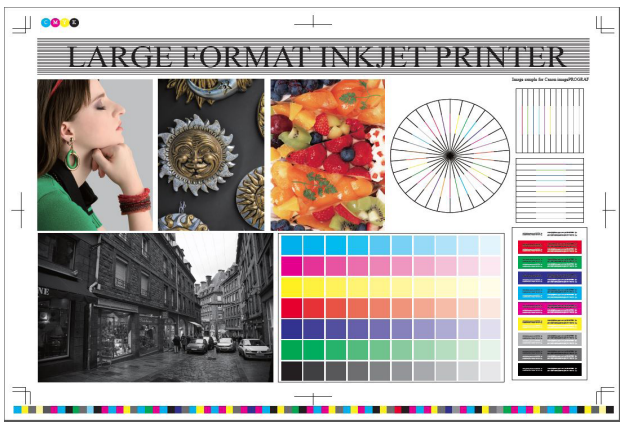
# Banner Printing

| Advantage ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Image Quality | = | = |
| Productivity | | ✓ |


## Keypoint Intelligence's Banner Test File

- The Canon GP-4000 successfully printed Keypoint Intelligence's 24" x 70" banner (a 4,955-KB PDF file) in Standard/Quality mode, taking 6.08 seconds to generate a preview at the desktop, and an additional five minutes, 16.36 seconds from preview to final paper cut. The Epson SC-P9500 also printed the whole banner image with no image quality issues; it took 9.88 seconds to generate a preview, and an additional five minutes, 01.00 seconds from preview to final paper cut, making it the slightly more productive device under this scenario.

# Ink Consumption




Packaging Proof


Retail Sales Poster

Studio Portrait

Keypoint Intelligence technicians observed that, owing to the vagaries of inkjet technology (for example, head flushing and calibration routines can occur at any time during testing), the same test can produce different results at different times. Although Keypoint Intelligence makes every effort to ensure that devices are tested on a level playing field, the test results should be regarded as an indicator of likely performance and not as a prediction of actual ink consumption in a real-world environment.

## Overall Weight of Ink Used (in Grams)

| Advantage ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Packaging Proof | 127.4 | 238.8 |
| Retail Sales Poster | 162.1 | 219.6 |
| Studio Portrait | 124.8 | 277.3 |

Results are averaged across three sets of 50-page A1 printing in High/High Quality mode.

+ The Canon GP-4000 used 46.6% less ink than the Epson SC-P9500 when printing a Packaging Proof test target in High/High Quality mode on proofing media. This translates to the Canon device using 1.6% of its total available ink, while the Epson model used 5.5%.

+ When printing the Retail Sales Poster test target in High/High Quality mode on matte coated media, the Canon unit used 26.2% less ink compared with the Epson SC-P9500. For the same print scenario, the Canon GP-4000 used 2.0% of its total available ink, while the Epson model used 5.1%.

+ In the Studio portrait ink consumption test conducted in High/High Quality mode using semi-gloss photo media, the Canon GP-4000 used 55.0% less ink compared with the Epson device, which meant it used 1.5% of its total available ink for the test, while the Epson SC-9500 used 6.4%.

## Supplementary Borderless Poster Ink Consumption Test

With both devices supporting borderless printing, Keypoint Intelligence ran a borderless poster print test in order to assess the difference in ink consumption usage between the two devices.

## Overall Weight of Ink Used (in Grams)

| Advantage ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Studio Portrait | 127.8 | 289.2 |

+ According to Canon, sensors on the GP series can detect the edges of the media precisely, which means the printer can print to the exact edge of the paper without the printhead travelling beyond and incurring some ink wastage. The Epson model does not offer this function and so in effect, it will print on to the area outside the media with some ink absorbed into the ink absorption pads.

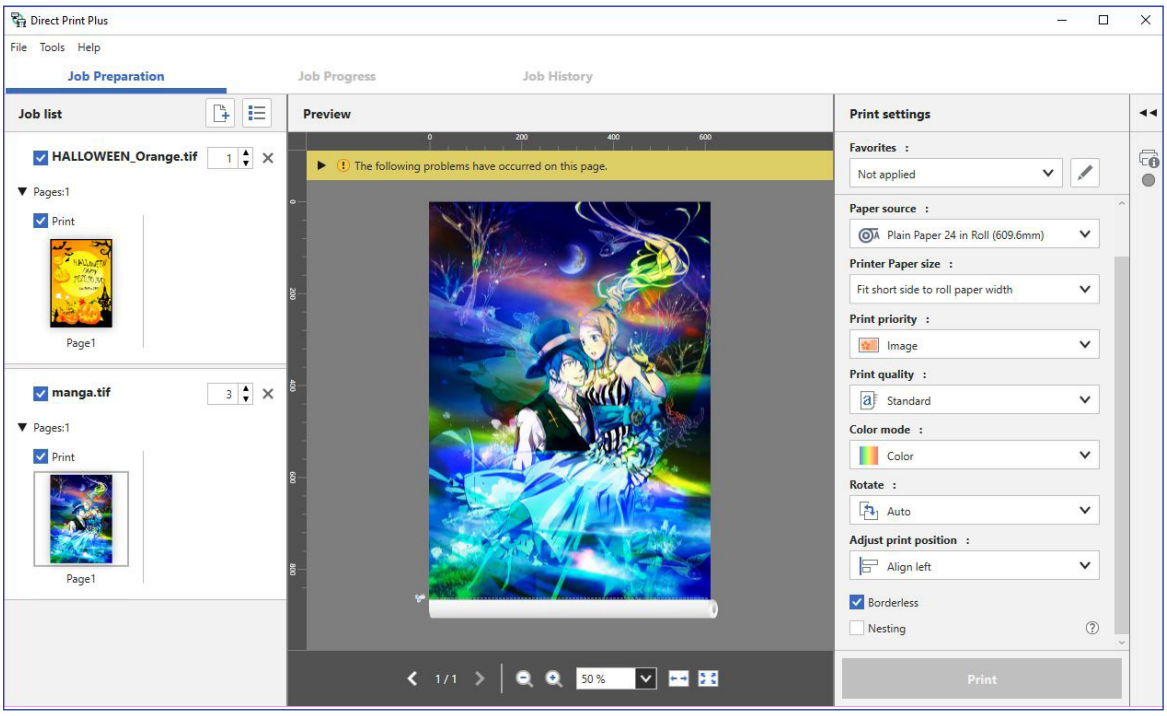
+ Compared with its Studio Portrait ink consumption test with border, the Canon model used 2.4% more ink for the borderless test—127.8 grams versus 124.8 grams. For its borderless portrait ink consumption test, the Epson device used 4.3% more ink than that used in the portrait with border ink consumption test. Again, the Canon GP-4000 used 55.8% less ink compared with the Epson model.

# Direct Print Submission Functionality

| Advantage ✓ | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Ease of Use | = | = |
| Direct Print Submission Functionality | ✓ | |
| Mobile App Integration | ✓ | |

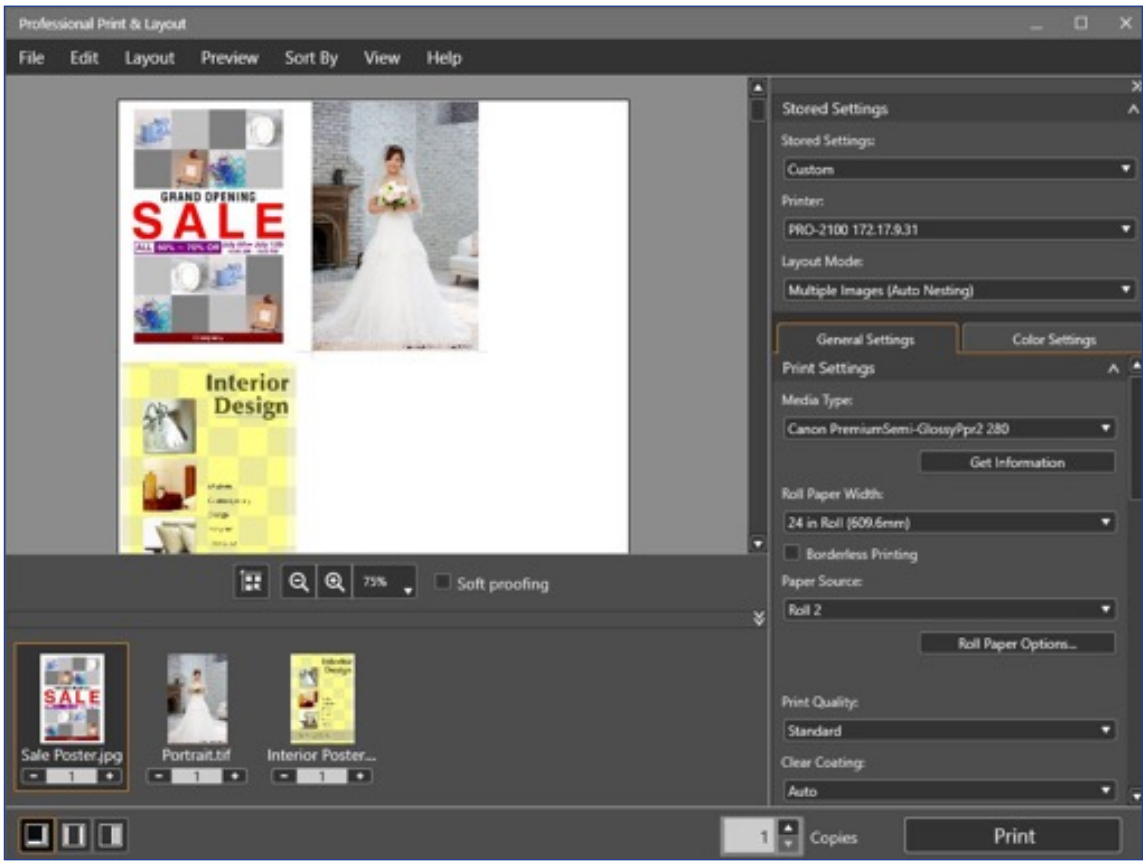
*Keypoint Intelligence technicians did not test Epson's optional, extra-cost PostScript module, and therefore did not assess its functionality.

O Canon's Direct Print Plus has an intuitive, clean interface, offering user friendly job submission capabilities. And, with a new PDF engine developed by Canon, Direct Print Plus provides improved processing and printing of PDF files. There are three tabbed sections: Job Preparation (the home screen), Job Progress, and Job History. The Job Preparation screen is arranged in four sections—Job list, Preview, Print settings, and Printer status—providing easy access to job settings, job thumbnail previews and at-a-glance printer and consumable status information, without the need to link to Status Monitor (a necessary step with the former utility). The bi-directional communication between the utility and printer means there's less chance of media mismatch.

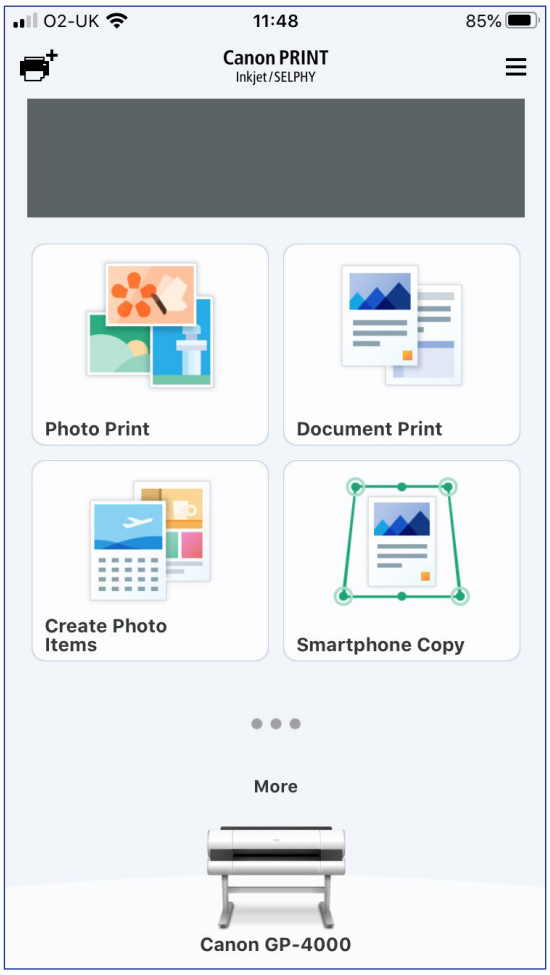


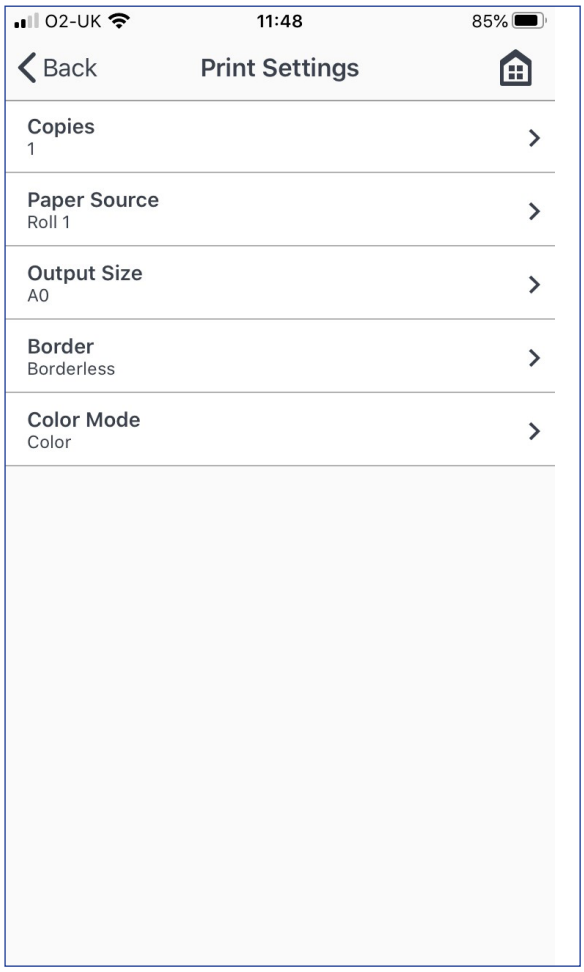

**Direct Print Plus job submission software enables the direct printing of PDF, JPEG, TIFF, and HPGL/2 files without the need for native applications or print drivers. From the Job History tab, users can print jobs selected from the print history log again using the same settings as when last printed. There is also a link to Canon Accounting Manager to keep track of project costs.**

+ As with the predecessor utility, Direct Print Plus supports 'Shortcut Print' functionality which helps streamline print workflows. Akin to a hot folder workflow, users can create desktop shortcuts that allow drag and drop automatic file printing with predefined print settings. Multiple desktop icons can be created containing different print settings or combinations of print settings.

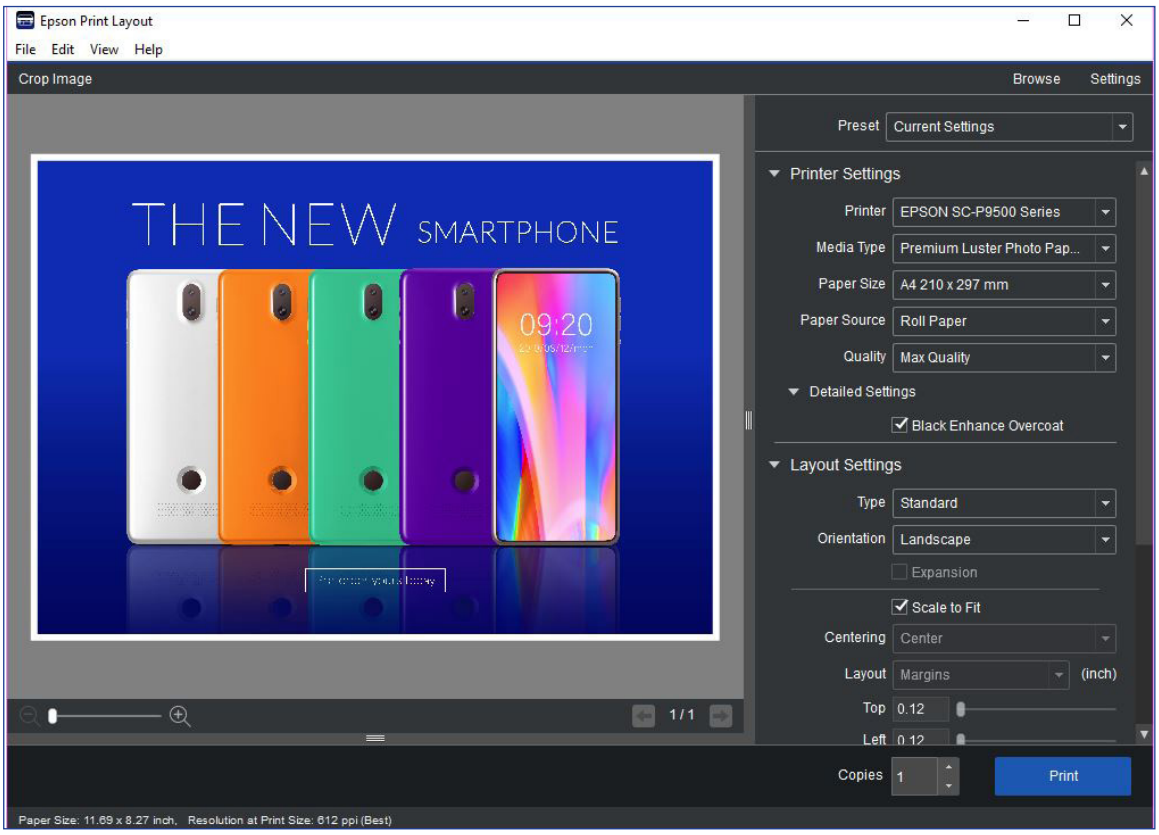



Canon's Professional Print & Layout utility enables files—even those created with different applications—to be scaled, resized, or grouped together as a single job. Both auto nesting and flexible nesting features enable media to be used more efficiently, with the latter option allowing users to drag and drop images to desired locations and print them together on a single page. Previews, soft proofing, and pattern printing all provide users with the ability to check and adjust the colour balance, contrast, or brightness by specifying a variation in instance and viewing the resulting 'pattern' to identify and select the desirable value. Job setting adjustments include colour management, print quality, image rotation, amongst others. The utility has a plug-in features with various software options designed to appeal to specific segments of the Graphic Arts market such as photography and fine art display. These include a print plug-in for Photoshop, which, according to Canon, allows users to print 16-bit files directly from Adobe RGB with a wide gamut and clear tonal gradation, as well as a plug-in for DPP (Digital Photo Professional) that includes a 'Digital Lens Optimizer' to improve photographic image quality and enhance depth of field; Adobe Lightroom is also supported.




The free Canon PRINT Inkjet/SELPHY mobile print app is an easy way for users to print wirelessly to the GP series and other compatible Canon large-format printers on the same WiFi network; it offers a broad range of print settings, including colour, orientation, and borderless printing and is very straightforward to use. Android users can use Canon Print Service app to print from their smart devices, as well. The Epson SureColor SC-P9500 does not offer mobile app print support.




**Epson Print Layout is a free utility which can be downloaded from Epson's website, which enables the direct printing of PDF, JPEG, and TIFF files. Users can preview print layouts, view thumbnail images of multiple print jobs, and select colour management and print settings directly within the utility. Users can also save job settings as presets (more than 100 presets can be saved) for easy repeat work. The utility has a plug-in function for Adobe Photoshop and Adobe Lightroom, as well as Nikon ViewNX-I, allowing users to preview and print photos directly from Nikon's image hub.**

- An optional (extra-cost) PostScript module, which was not evaluated, will provide Epson users direct printing functionality, enabling PDF printing directly from programs such as AutoCAD, as well as the ability to print EPS, JPEG, TIFF, Cals-G4 formats. The module also provides hot-folder 'drag-and-drop' functionality with configurable job processing options.

# Device Feature Set

+ The Canon GP-4000's ink set includes red, orange, green, and violet inks along with fluorescent pink for added application versatility. According to Canon, its 'Radiant Infusion' technology layers the fluorescent pink ink with the other colours on the paper during printing, and the characteristics of the fluorescent pink ink means that light is both absorbed and emitted, thus culminating in intensely vivid and luminous colours on output.

O The Epson SureColor SC-P9500 employs 12 inks, which are orange, green, violet, two grey and two black inks, as well as vivid magenta, vivid light magenta, light cyan, cyan and yellow.

+ Canon inks are replaceable during operation, helping to reduce downtime for users, whereas Epson's cartridges cannot be replaced on the fly.

O Canon offers three replacement ink cartridge capacity options—160/330/700 ml—for all colours, whilst the Epson SC-P9500 accommodates 350-ml (standard) and 700 ml (high-yield) capacity ink cartridges for all colours.

- The Canon unit's ink delivery system dispenses a slightly larger 4-picoliter drop size for all colours than the Epson ink delivery system (3.5-picoliter for all colours).

+ The Canon unit has a user-replaceable printhead, taking less than five minutes to replace with the process initiated on the control panel, whereas the Epson unit's printhead is only service-replaceable.

O The Epson SC-P9500 offers simple user maintenance procedures to minimize downtime, with manual printhead and cap cleaning (using swabs to clean gently around the inner edges of the borderless pads), and borderless pad replacement. Automatic printhead maintenance is available on both devices.

+ Media loading is smooth, fast, and efficiently handled on the Canon GP-4000, thanks to its automatic paper feed function. Once the media roll holder is locked in place on the unit, the printer will begin to rotate the media roll and a built in sensor locates the edge of the paper. When it detects the edge, the GP-4000 feeds and loads the media automatically, so there's no further user intervention required. Built-in sensors measure the light reflection on the paper and the paper thickness to identify its characteristics; in the event of a brand new media being used for the first time on the device, the operator may have to indicate the media type on the control panel. Thereafter, however, the device will automatically detect paper type whenever it is loaded again.

O Keypoint Intelligence's technicians also appreciated the Epson SC-P9500's straightforward media loading process at the top of the device. The machine has a handy resting area to place rolls when loading and unloading media. The operator must manually feed the paper edge into the machine until there is an audible beep, after which the printer will load the paper automatically, if the Auto Paper Feed option is enabled. To complete the process, the operator must confirm the media type on the control panel and then close the roll cover.

+ The Canon GP-4000 is designed with two sensors that can measure and estimate the remaining length available on the media roll, with the information displayed on the touchscreen. This feature eliminates the need for the machine to print and read a barcode each time a partially-used roll is loaded and unloaded. It also reduces the risk of media running out halfway through a job as operators will be alerted on the control panel as to whether there is enough media to complete their job.

O The Epson SC-P9500 offers paper tracking capabilities, as well; when removing a partial roll, a media information barcode with remaining roll length and type of paper can be printed on the roll's edge, and it is also displayed on the control panel, for added convenience.

+ The Canon GP-4000 supports borderless printing regardless of what media is being used, with a media sensor detecting the edges and automatically adjusting the margin, so there is no ink waste; users can choose free size or three-sided borderless. The Epson SC-P9500 supports borderless printing only with select media and common media widths.

+ The Canon device includes a media mismatch option which holds jobs that can't be printed due to incorrect media being loaded, while jobs that can be completed are printed; the queued jobs are printed once the required paper is loaded. In the event of a media mismatch on the Epson device, printing will be suspended until the required media type is loaded for the submitted job. If the optional hard drive is installed on the machine, jobs can be held temporarily until suitable paper is loaded, while all jobs that are slated for the paper type that is already loaded will print without delay. Users are provided with a control panel warning, which appears after the job is submitted.

+ Both models support Gigabit Ethernet connectivity, but the Canon GP-4000 also offers a wireless interface (not matched by the Epson SC-P9500).

+ The Canon device supports the direct printing of PDF and JPEG files from a USB flash drive, which helps aid document portability; this not available with the Epson unit.

- Developed in conjunction with X-Rite, an optional spectrophotometer (which Epson calls a SpectroProofer) with automated inline proofing colour control is available with the Epson unit, enabling faster and more advanced colour management—an option that's not offered with the Canon model.

O However, the Canon GP-4000 does have a built-in Color Calibration function (accessible via the Maintenance screen) which uses a multi-sensor to read colour density and automatically calibrate the printer with Canon media, as well as other media brands. Canon's free Device Management Console utility allows administrators to control colour and monitor the calibration status across the whole GP series, ensuring colour consistency among all Canon devices.

+ Standard, non-upgradable 3-GB RAM capacity is available with the Canon unit, slightly higher than the Epson model's standard non-upgradable 2-GB memory capacity.

+ The Canon GP-4000 comes with a built in self-encrypting 500-GB hard drive, which allows for the storage of commonly used documents and aids spooling workflow; a 320-GB self-encrypting hard drive is available with the Epson SC-P9500 only as an option.

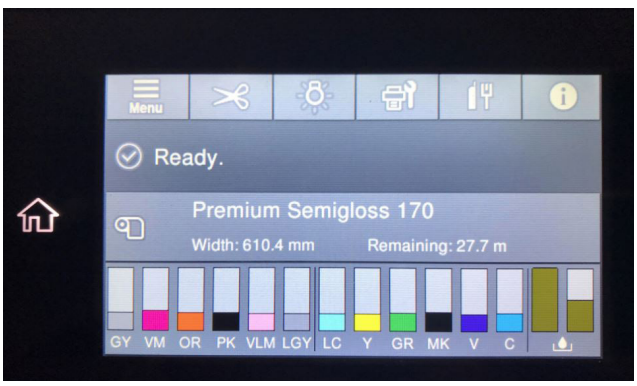
+ For maximum convenience and minimum downtime, an optional dual-roll unit is available with the Canon unit (but not the Epson model), giving users the added flexibility of switching between different media types or sizes without having to reload the media each time.

+ The GP-4000's optional Multifunction Roll System can also act as an auto Take-up-Roll unit with bi-directional rewind, which could be an extremely valuable feature in high-volume production environments, enabling large numbers of prints to be conveniently stored on a single roll. A Take-up Roll unit is available as an extra cost option with the Epson SC-P9500.

- The Canon GP-4000 comes with a simple output catch basket, which collects prints as they emerge from the device. The Epson SC-P9500 is designed with a retractable and configurable media catch basket which collects output print-side up and in a neat and tidy fashion. Keypoint Intelligence technicians observed that this works better for single prints or short-run jobs, as multiple sheets can build up on the Epson basket and cause jamming issues.

O Both models' control panels are bright and responsive, and offer clear menu settings to simplify walk-up operation. From the home screen, operators can readily view printer, paper, and ink status, and the Epson unit's touchscreen displays Maintenance Box status as well.


Canon GP-4000's Control Panel




Epson SC-P9500's Control Panel

**Keypoint Intelligence technicians found that the Canon and Epson user interfaces were similarly intuitive and bright, with well-designed menus and easy-to-navigate settings. The Epson SC-P9500 offers a larger display which aids with the presentation of information, but that said, there was no clear cut preference. When printing, the Canon GP-4000's display shows the title of the job it is running, alongside the time that's left to output the page it is currently printing. The Epson device shows the remaining print time of the current page being printed, as well as number of pages printed so far of the sent job (but not the total number of pages in the job), which is useful as the user has an indication of how many pages are left to print. Canon users can view this information via Status Monitor at the desktop. Canon users can also scroll through the menu system while the device is printing, but Epson users will have to pause operation in order to navigate menu settings.**

- The Epson SC-P9500's illuminated interior (which can be switched on and off at the control panel) makes it very easy for the user to identify the printing position and status of the job that's being printed (an internal light is not available with the Canon model).

+ The Canon model is lighter (124 kg versus 153.8 kg) than the Epson unit, and more compact, with a width of 1,593 mm versus 1,909 mm for the Epson SC-P9500.

+ The Canon GP-4000 power consumption in standby mode is fractionally lower—2.0 watts versus 3.4 watts—to that of the Epson model. Similarly, while printing its power consumption is lower (99 watts versus Epson SC-P9500's 110 watts).

# Print Driver Feature Set

O Both models offer a variety of speed settings, although depending on the media type selected, not all speed options will be available.

O The Canon driver includes 54 media profiles versus 33 for the Epson driver. The Epson Media Installer utility (which can be linked via the Utility tab in the printer driver) allows users to create and store up to 30 custom media profiles for use when printing on non-Epson paper or paper that's not supported in the printer driver.

+ The Canon GP-4000 driver includes a watermark capability; the Epson driver does not.

+ The Canon driver offers N-up printing (16-up maximum), while the Epson driver supports 2 to 4 multi-up printing.

- Both devices offer a poster mode: the Canon driver has a 2 by 2 poster mode, while the Epson model supports 4 by 4 posters.

- The Canon driver offers page stamping (Date, Time, Name, and Page Number), while the Epson driver offers a much wider range of options, including extensive image quality attributes.

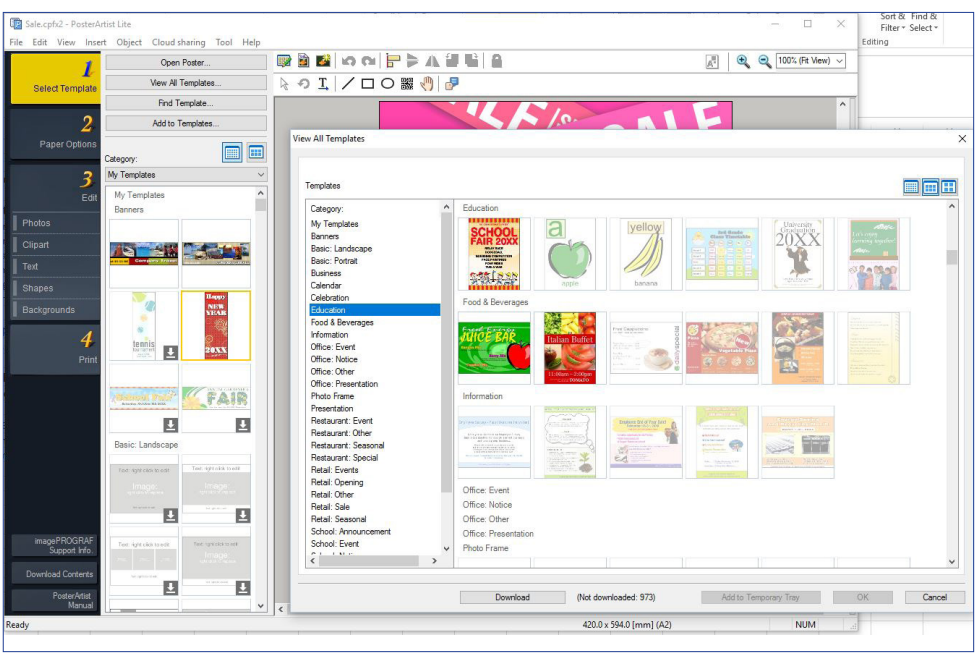
+ The Canon driver has a unidirectional printing option, which helps to eliminate banding across output because the printhead travels in only one direction when creating the image. The Epson driver does not offer this feature.

O Both the Canon and Epson drivers offer a wide range of built-in adjustments for CMY, balance, brightness and contrast. ICC profile settings are also available with both drivers—in the case of Canon's driver in its Matching tab under Colour Settings. Canon operators can select four modes— Driver Matching, ICC Profile Matching, ICM (and choose one of four rendering methods—perceptual, relative colorimetric, absolute colorimetric or saturation) or Off. The Epson driver offers Driver ICM (Basic or Advanced) and Host ICM, and the same four rendering methods. The Black Enhance Overcoat option improves sharpness on glossy media and enhances black density, according to the manufacturer.

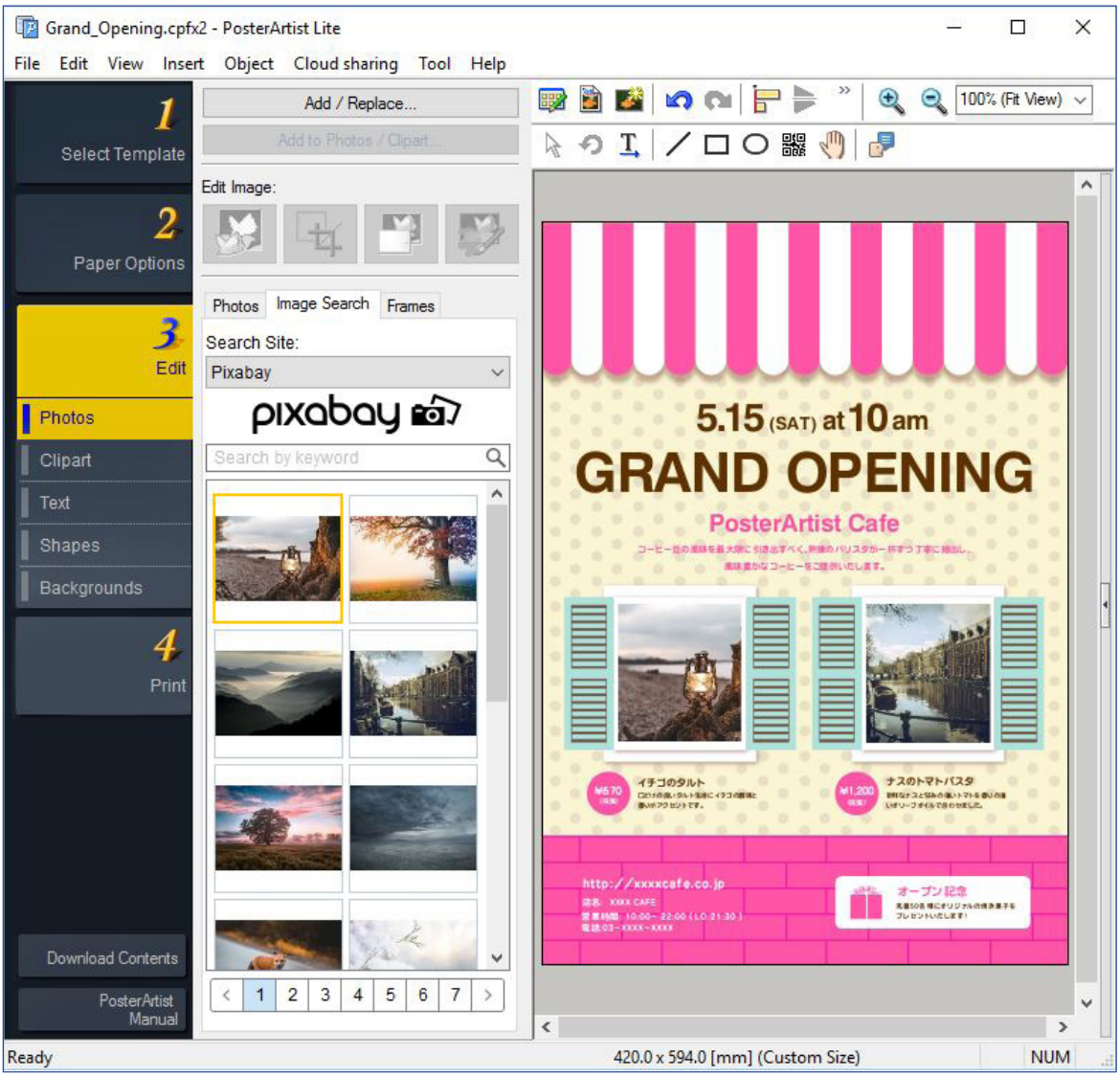
+ The Canon driver includes a utility, Colour imageRUNNER Enlargement Copy Mode, which allows users to integrate a Canon MFP or other scanner with the GP-4000. Documents scanned by the Canon MFP, or another configured scanner are automatically routed to a hot folder, which is monitored by the GP-4000 driver. The image is then resized and printed, offering a fast, easy-to-use poster creation tool for office users.

O The Canon model offers a plug-in for printing from Microsoft Office applications, which includes useful tools for automatic media resizing, nesting and borderless printing. Epson offers similar software, Epson Print Plug-in for Office (available as a free download), which enables users to click on a file name and, without opening the application, set individual options such as print size, rotation, print quality and number of copies before printing. Supported file formats include PDF, TIFF, JPEG and PPT.

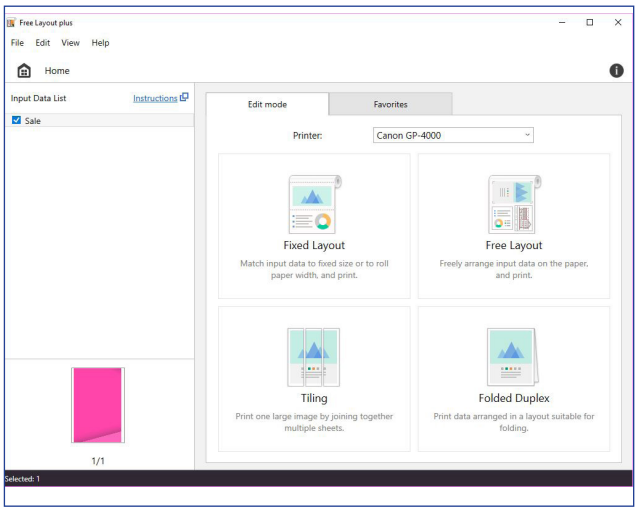
O Free to download, Canon Accounting Manager offers comprehensive accounting management for print jobs. Actual costs for individual inks and media types can be entered, allowing for the cost per job to be calculated automatically and recorded. For each job, the media type, area, ink used and total print time are listed, and more detailed cost and consumption information can be obtained by double-clicking on an individual job name or by highlighting a range of different jobs. Job cost information can then be saved in .CSV format and opened in Excel. Epson offers the free LFP Accounting Tool which automates accounting for SureColor users. In addition to tracking the costs of ink and media, this handy utility can be used to track ancillary costs such as lamination, labour, and transportation.

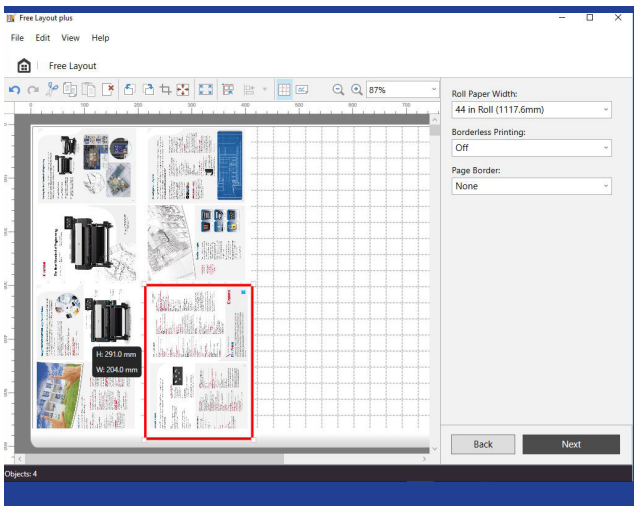



**Bundled with the GP series, PosterArtist Lite is an easy-to-use, sophisticated poster and signage creation tool. The latest version offers several new features including stock photo library services (see below) and the ability to print with and without fluorescent pink ink, with new templates included for when FP ink is utilized. It supports a Vivid mode that uses "Radiant Infusion" technology to achieve brighter colours, and a Spot mode that will use FP ink in specific pink- and orange-related areas in order to make those colours pop. In addition, the software offers pictographic icons and multiple templates, organized by type and event, as well as the ability to create multi-language versions of a poster that includes 900 common expressions in 10 languages.**

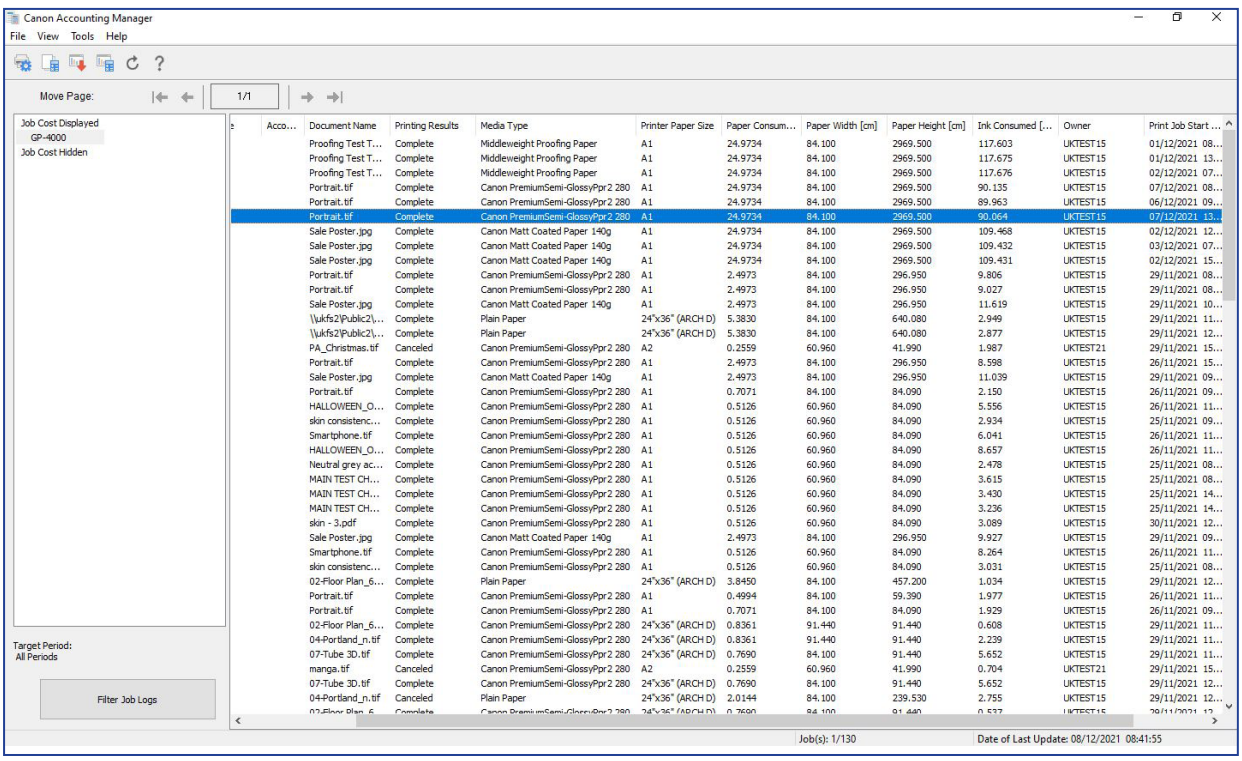


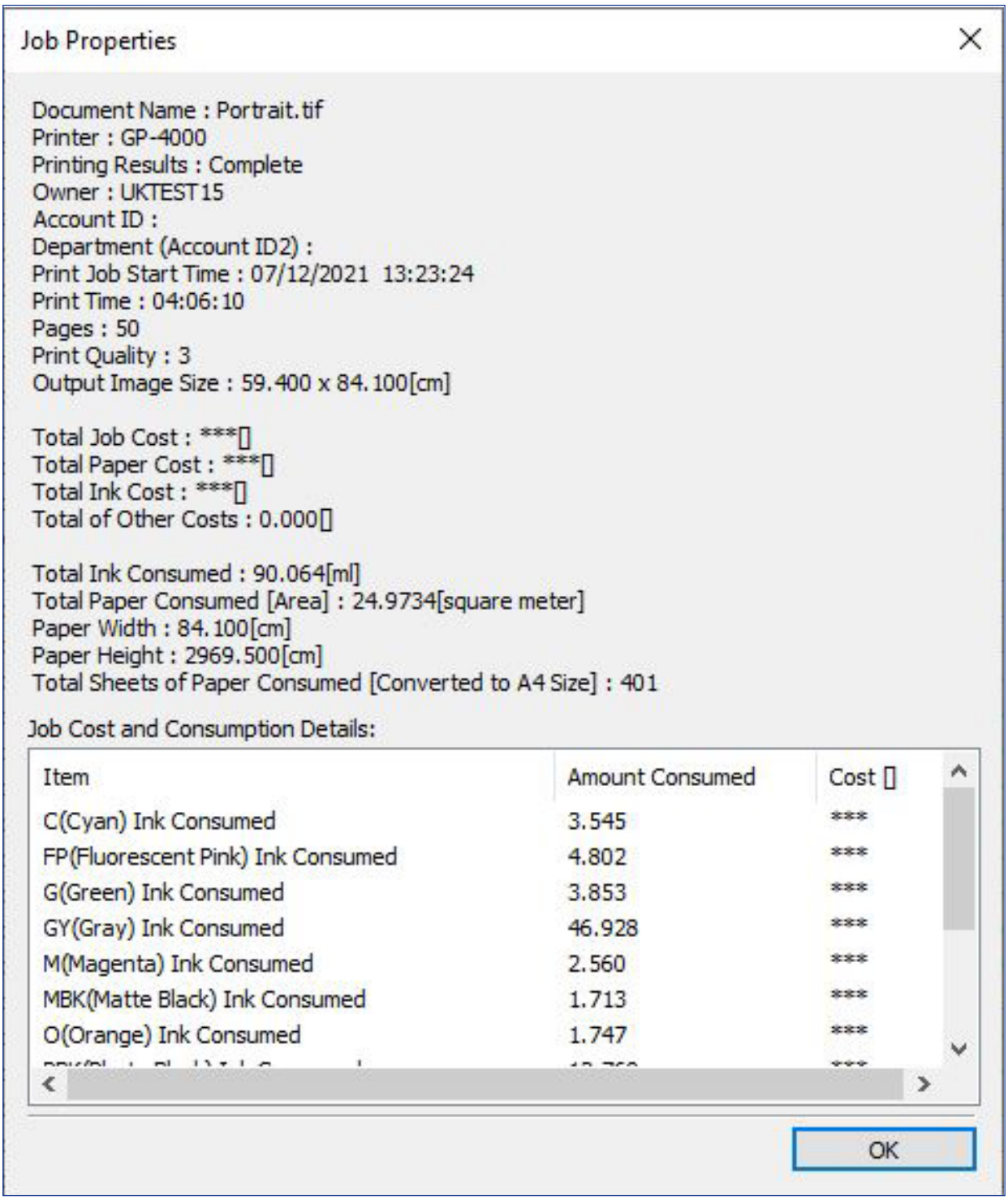

**The latest version offers upgraded features such as the ability to access three stock photo library services—Pixabay, Pexels, and Unsplash—for free. Users can search from an extensive range of royalty-free images and download them for use.**



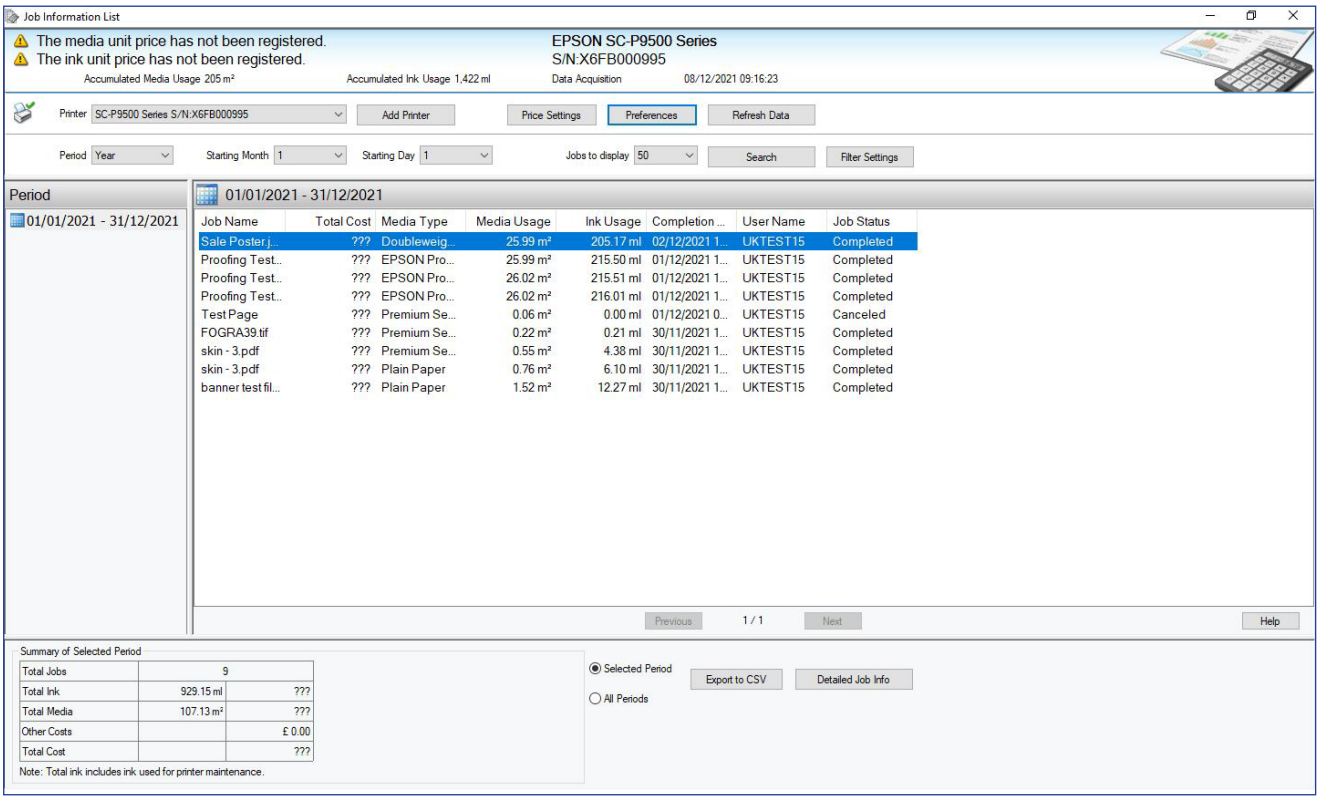



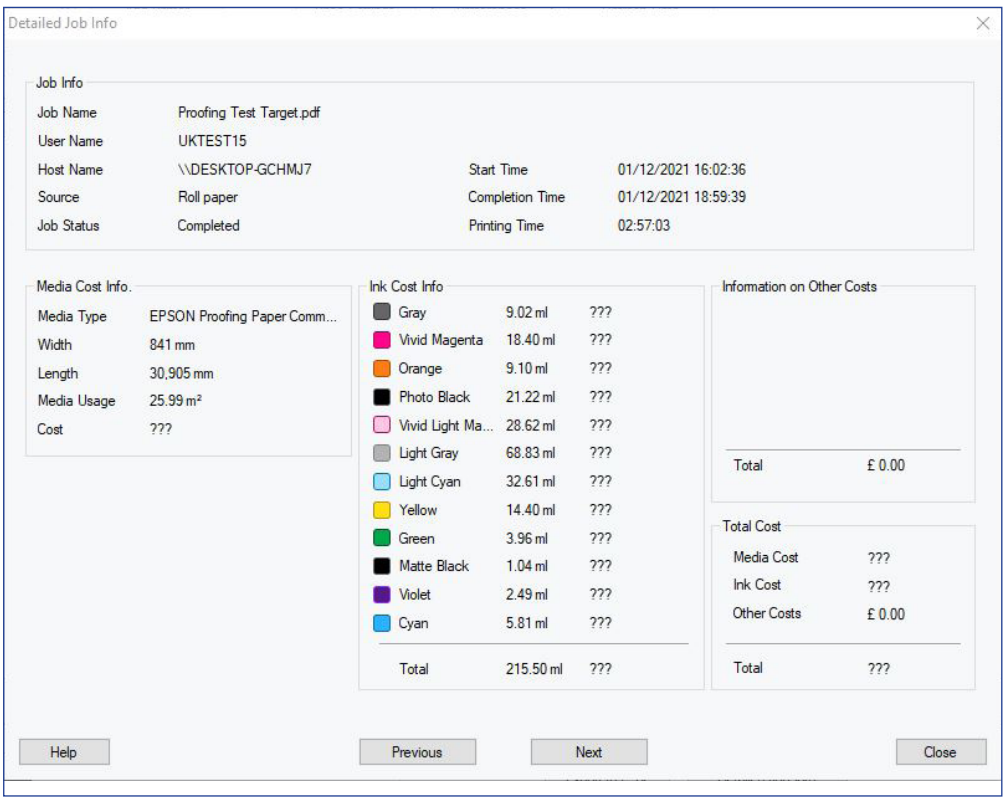

**Within PosterArtist Lite, users can opt to edit their layouts with Free Layout plus tool before printing, which allows users to customize the arrangement of files so media is utilized as efficiently as possible. Moreover, any two pages can be arranged for double-sided printing so that they are orientated correctly when folded after printing. Epson also offers resizing functionality and the ability for users to combine multiple documents to print on a single layout via its Epson Print Layout utility.**





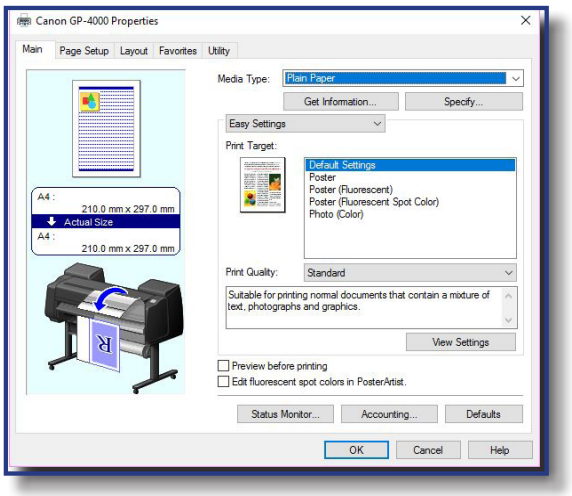

Canon Accounting Manager



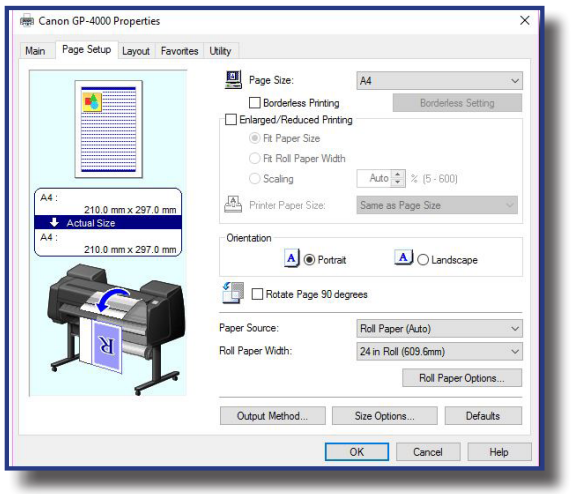




**Epson LFP Accounting Tool. Keypoint Intelligence technicians liked the colour-coded ink cost information for easy lookup.**

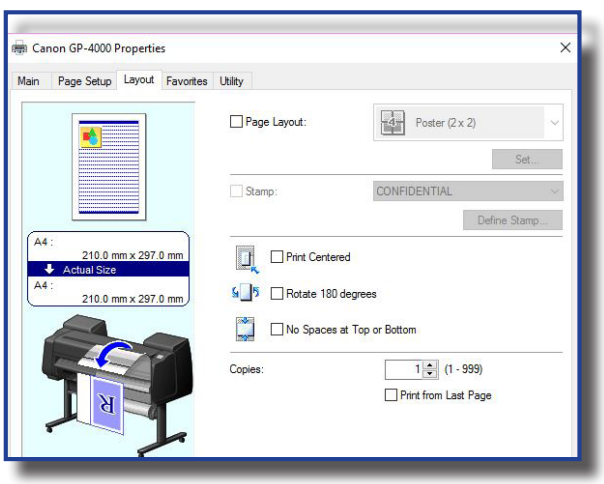
# Test Models' Print Driver Screenshots



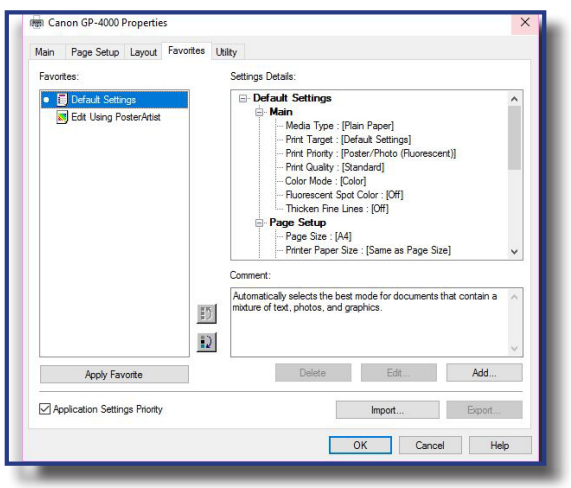

Canon GP-4000 Main tab



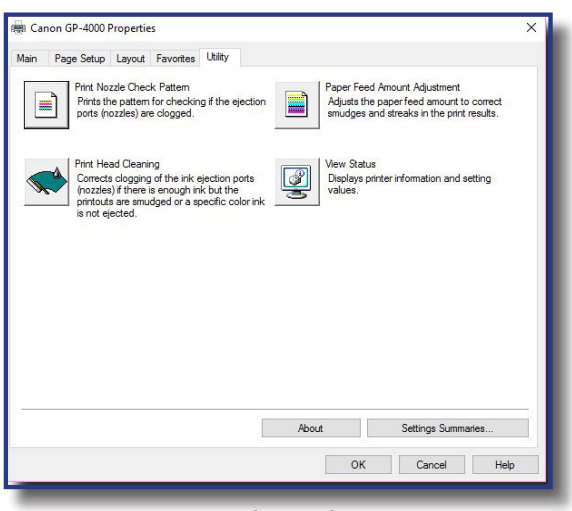

Canon GP-4000 Page Setup tab



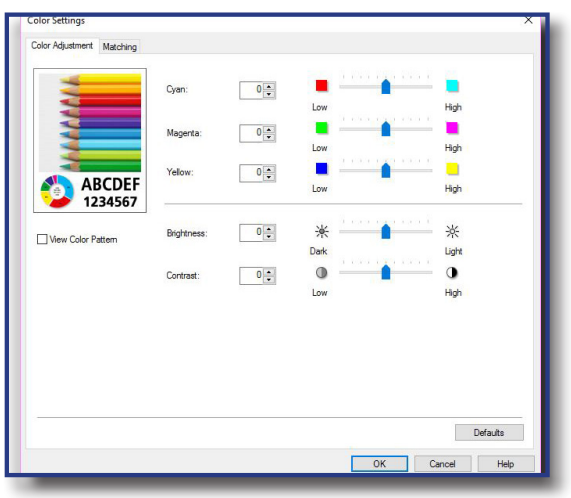

Canon GP-4000 Layout tab



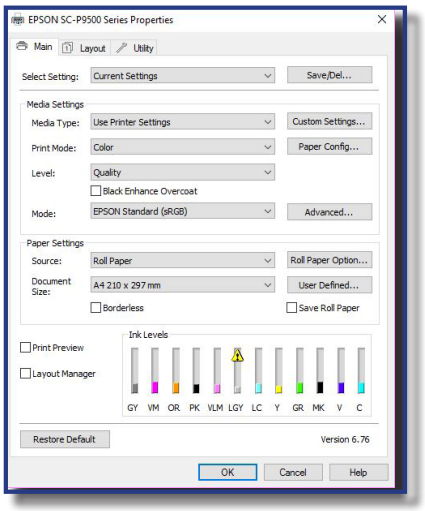

Canon GP-4000 Favourites tab

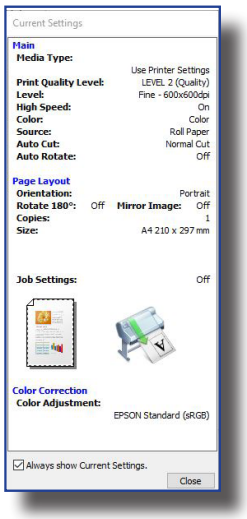



Canon GP-4000 Utility tab

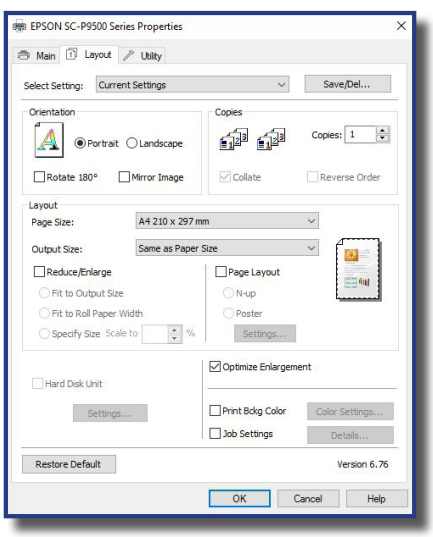



Canon GP-4000 Colour Adjustment Settings

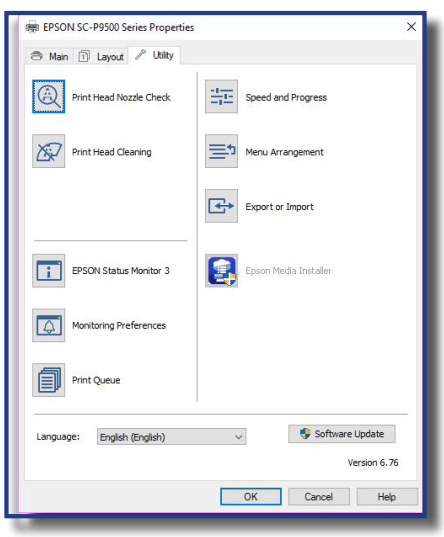


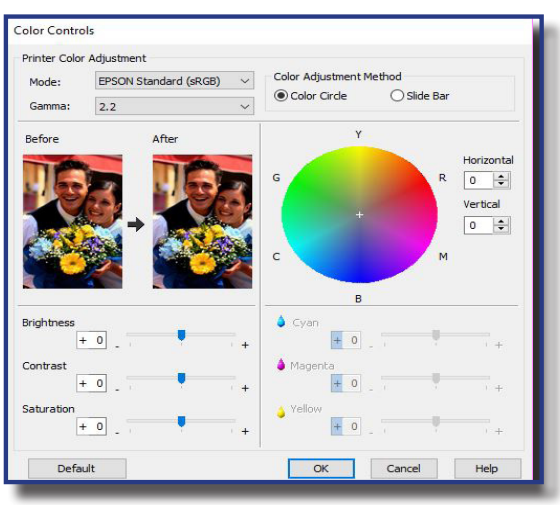

Epson SureColor SC-P9500 Main Tab with Current Settings displayed.




Epson SureColor SC-P9500 Layout Tab




Epson SureColor SC-P9500 Utility Tab




Epson SureColor SC-P9500 Colour Control Settings

# Printhead Reliability / Cleaning Routines

O The Canon GP-4000 enables users to run a printhead nozzle check pattern at the control panel and from the embedded web page. The default setting is 'Auto nozzle check', with users able to specify a fixed page interval for it to be performed. Under Printer Settings, the Auto Maintenance settings menu includes an auto system cleaning option, as well. Similarly, the Epson SC-P9500 has an Auto Cleaning function (must be enabled). Users can select whether the device runs a nozzle check during a print job or after printing, as well as the level of sensitivity (Standard or High Sensitivity). A nozzle check pattern can be initiated from the printer driver and at control panel.

O When a clogged nozzle is detected on the Canon unit, it pauses during operation and automatically runs a cleaning cycle to maintain image quality and consistency; it resumes printing once the cleaning cycle is completed, with no user intervention required. The Epson device will also conduct a printhead clean procedure (if Auto Cleaning is enabled) should it detect a clogged nozzle.

O In the event of image quality issues, Canon users are advised to perform a printhead clean cycle, which can be initiated from the desktop and at the control panel. There are three levels of cleaning offered: cleaning, deep cleaning, and system cleaning; the first two types take between two and three minutes, while a system clean can take up to five minutes. System cleaning (standard and short options) should only be performed if the other two cleaning routines have not rectified nozzle clogging issues. Users can opt to clean all colours or by ink group. Epson users can initiate a 'Wiping the Printhead' maintenance process at the control panel for a pair of printheads or more. An estimate of time to complete the maintenance is displayed on the control panel, which differs depending on how many printheads are selected. For a deeper clean, users can initiate a Power clean, selecting different pairs of colours to clean.

\+ A standard cleaning cycle performed on the Canon model takes approximately two minutes, 27.69 seconds on average to complete, whilst on the Epson model, a cleaning cycle lasts eight minutes, 0.36 seconds.

\+ After both devices were turned off over the course of a weekend, upon restarting the following Monday, the Canon model had no problems with clogged nozzles and printed a nozzle check pattern perfectly. The Epson device experienced one clogged nozzle (light grey ink), which was cleared after a clean.

# SUPPORTING TEST DATA

# Productivity

## Colour Throughput Time – A1 High-Resolution Portrait Printing (in Seconds)

| Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|---|---|---|
| Standard | Speed | High | Quality | Highest | Max Quality |
| 200.78 | 254.98 | 294.18 | 353.01 | 465.56 | 687.72 |

A single-page high-resolution A1 portrait was printed as a five-page job using the device driver set to the semi-gloss photo/colour setting. The Epson driver's Black Enhance Overcoat option was also enabled. Both devices were loaded with 24" rolls, with each job set to auto-rotate to save media. The time indicated is the average number of seconds (based on timing from the cutting of the first page to the cutting of the final page and dividing by four to exclude the initial processing time).

## Colour Throughput Time – A1 Medium-Resolution Retail Poster Printing (in Seconds)

| Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|---|---|---|
| Standard | Speed | High | Quality | Highest | Max Quality Lv4 |
| 103.46 | 107.95 | 194.56 | 125.94 | 269.68 | 400.01 |

A single-page medium-resolution A1 retail sales poster was printed as a five-page job using the device driver set to the matte coated/colour setting. Both devices were loaded with 24" rolls, with each job set to auto-rotate to save media. The time indicated is the average number of seconds (based on timing the cutting of the first page to the cutting of the final page and dividing by four to exclude the initial processing time).

## First-Print-Out Time from Ready State – High-Resolution Portrait Printing (in Seconds)

| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|---|---|---|---|
| | Standard | Speed | High | Quality | Highest | Max Quality |
| Time Before Printing Commences | 25.24 | 34.04 | 27.53 | 37.86 | 26.38 | 35.09 |
| First Print Out Time | 212.06 | 268.24 | 303.75 | 382.00 | 461.13 | 717.47 |

First-page-out times are determined by sending an A1 high-resolution portrait PDF file to print, timed from job release to page out, with both Canon and Epson drivers set to semi-gloss photo media. The Epson driver's Black Enhance Overcoat option was also enabled. Both devices were loaded with 24" rolls.

### First-Print-Out Time from Ready State – Medium-Resolution Retail Poster Printing (in Seconds)

| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|---|---|---|---|
| | Standard | Speed | High | Quality | Highest | Max Quality Lv4 |
| Time Before Printing Commences | 21.34 | 33.18 | 21.66 | 33.07 | 21.67 | 32.76 |
| First Print Out Time | 107.70 | 129.88 | 192.07 | 142.19 | 275.13 | 423.34 |

First-print-out times are achieved by sending an A1 medium-resolution retail sales poster PDF file to print, timed from job release to page out with both Canon and Epson drivers set to matte coated media. Both devices were loaded with 24" rolls.

# Colour Print Quality

## Colour Optical Density Evaluation

| Canon imagePROGRAF GP-4000 | | | | | | |
|---|---|---|---|---|---|---|
| | Highest | | | | | |
| | 1 | 2 | 3 | 4 | Max. | Min. |
| Cyan | 2.22 | 2.25 | 2.23 | 2.23 | 2.25 | 2.22 |
| Magenta | 1.95 | 1.93 | 1.84 | 1.73 | 1.95 | 1.73 |
| Yellow | 1.11 | 1.09 | 1.11 | 1.11 | 1.11 | 1.09 |
| Black | 1.86 | 1.89 | 1.90 | 1.88 | 1.90 | 1.86 |

| Epson SureColor SC-P9500 | | | | | | |
|---|---|---|---|---|---|---|
| | Max Quality | | | | | |
| | 1 | 2 | 3 | 4 | Max. | Min. |
| Cyan | 2.24 | 2.23 | 2.31 | 2.29 | 2.31 | 2.23 |
| Magenta | 1.82 | 1.81 | 1.84 | 1.85 | 1.85 | 1.81 |
| Yellow | 1.03 | 1.02 | 1.04 | 1.06 | 1.06 | 1.02 |
| Black | 1.93 | 1.94 | 1.90 | 1.97 | 1.97 | 1.90 |

Note: Colour density readings were assessed by printing a Keypoint Intelligence proprietary PDF test target on proofing paper at the respective Highest/Max Quality driver settings, with no colour correction. Density was measured with an XRite exact$^{Xp}$ densitometer.

## Skin Tone and Neutral Grey Consistency

| Skin Tone 1 (Formula: C=6, M=15,Y=16,K=0) | | |
|---|---|---|
| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
| **Colour block** | | |
| 2 | 0.37 | 0.27 |
| 3 | 0.45 | 0.24 |
| 4 | 0.16 | 0.21 |
| 5 | 0.31 | 0.36 |
| 6 | 0.40 | 0.81 |
| 7 | 0.62 | 0.15 |
| 8 | 0.84 | 0.32 |
| 9 | 0.70 | 0.79 |
| **Max. Delta E Variance** | **0.68** | **0.66** |

| Skin Tone 2 (Formula: C=30, M=63,Y=75,K=0) | | |
|---|---|---|
| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
| **Colour block** | | |
| 2 | 0.93 | 0.09 |
| 3 | 1.11 | 0.18 |
| 4 | 0.31 | 0.10 |
| 5 | 1.27 | 0.34 |
| 6 | 1.11 | 0.61 |
| 7 | 0.41 | 0.42 |
| 8 | 1.24 | 0.63 |
| 9 | 1.18 | 1.03 |
| **Max. Delta E Variance** | **0.96** | **0.94** |

| Skin Tone 3 (Formula: C=19, M=33,Y=50,K=0) | | |
|---|---|---|
| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
| **Colour block** | | |
| 2 | 0.37 | 0.43 |
| 3 | 0.45 | 0.49 |
| 4 | 0.36 | 0.19 |
| 5 | 0.88 | 0.24 |
| 6 | 0.86 | 0.95 |
| 7 | 0.54 | 0.73 |
| 8 | 0.68 | 0.50 |
| 9 | 0.74 | 0.74 |
| **Max. Delta E Variance** | **0.52** | **0.76** |

| | Neutral Grey | |
|---|---|---|
| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
| **Colour block** | | |
| 2 | 0.24 | 0.20 |
| 3 | 0.32 | 0.51 |
| 4 | 0.17 | 0.43 |
| 5 | 0.31 | 0.33 |
| 6 | 0.45 | 0.22 |
| 7 | 0.19 | 0.51 |
| 8 | 0.24 | 0.22 |
| 9 | 0.46 | 0.34 |
| **Max. Delta E Variance** | **0.29** | **0.31** |

Note: Skin tone and neutral grey consistency measurements are based on nine readings taken from a Keypoint Intelligence proprietary PDF test target file comprising four A1-sized solid coverage documents of three skin tones and a neutral grey with the Highest/Max Quality setting selected in the driver and the target printed on the manufacturer's own brand of proofing semi-gloss media, with no colour correction. Colour differences across the A1 image were measured comparing eight locations to that of the colour measured at the top left of the page, using an EFI ES1000 colour spectrophotometer and Gretag MacBeth EyeOne Share colour comparison software.

# FOGRA 39 Drift Test

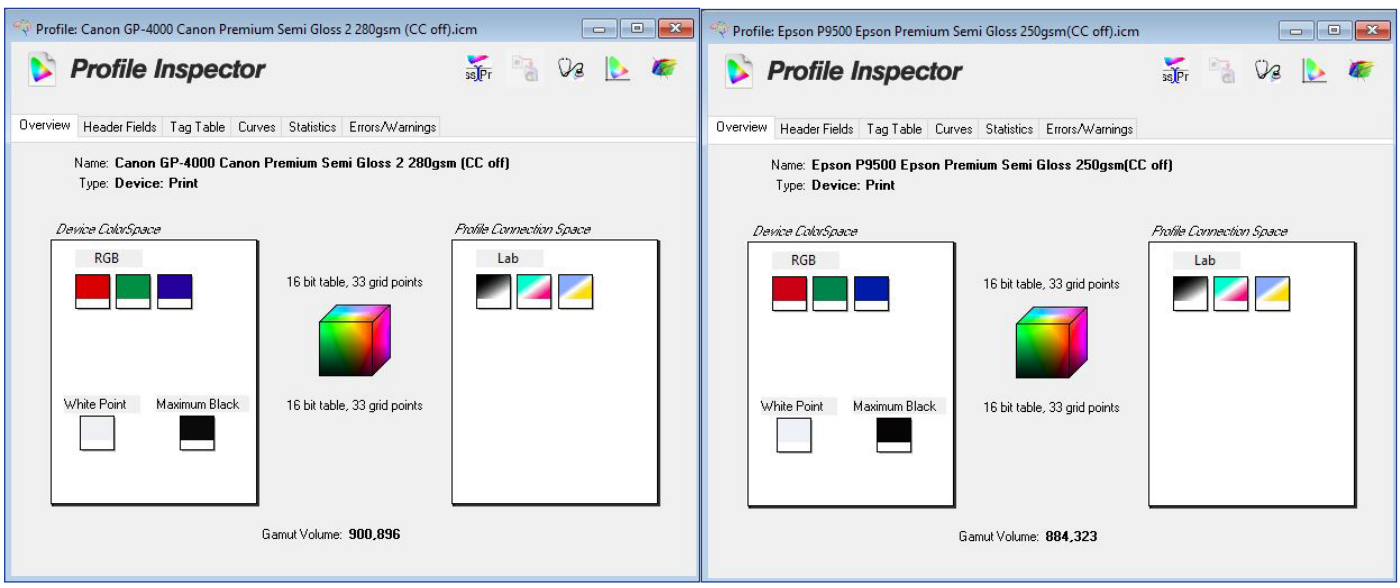
## Comparison of FOGRA39 colour patches before and after ink consumption test

| | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 |
|---|---|---|
| Delta E Drift | 0.4 | 0.4 |

## Colour Gamut Cubic L*a*b Unit Volume Comparison

| Media Type/Settings | Canon imagePROGRAF GP-4000 | Epson SureColor SC-P9500 | Canon % larger/smaller (-) than Epson |
|---|---|---|---|
| Semi Gloss Photo Paper Highest/Max Quality | 900,896 | 884,323 | 1.87% |


Canon imagePROGRAF GP-4000 colour gamut (shown chromatically) on semi-gloss photo paper in Highest mode with colour correction disabled versus Epson SureColor SC-P9500 colour gamut (red) on semi-gloss photo paper in Max Quality mode with colour adjustment disabled.




Colour gamut profile for Canon imagePROGRAF GP-4000 (left) and Epson SureColor SC-P9500 (right) on gloss photo paper in highest-quality mode.

# Device Feature Set

| | Canon imagePROGRAF GP-4000 | Advantage | | Epson SureColor SC-P9500 |
|---|---|---|---|---|
| Max. print resolution | 2400 x 1200 dpi | | | 2400 x 1200 dpi |
| Number of inks | 11 (FP, R, O, G, V, PBK, MBK, C,M,Y, GY) | | | 12 (GY, VM, O, PBK, VLM, LGY, LC, Y, G, MBK, V, C) |
| Ink tanks replaceable during operation | Yes | ✓ | | No |
| Ink-drop size | Minimum 4 picoliter | | ✓ | Minimum 3.5 picoliter (variable) |
| Starter cartridge ink capacity | 330 ml bundled starter ink per colour | | | INA |
| Ink cartridge capacity | 160 ml, 330 ml, and 700 ml (all colours) | | | 350 ml and 700 ml (all colours) |
| Number of nozzles | 18,432 nozzles in total (1,536 x 12 channels) | ✓ | | 9,600 nozzles in total (800 nozzles per colour) |
| Number of printheads | 1 | | | 1 |
| Printhead replacement | User replaceable | ✓ | | Service replaceable |
| Line accuracy | +/-0.1% or less | | | INA |
| Minimum line width | INA | | | INA |
| Minimum print margins | Roll paper: Borderless or 3 mm (all sides); Cut sheet: 3 mm (Top, Side), 20 mm (Bottom) | | | Borderless or 3 mm (all sides); Cut sheet: 3 mm (Top, Side), 14 mm (Bottom) |
| Borderless (0 mm) printing | Yes, all sizes and media supported | ✓ | | Yes, with select media and sizes (254 mm, 300 mm, 329 mm, 406 mm, 432 mm, 508 mm, 515 mm, 594 mm, 610 mm, 728 mm, 841 mm, 914 mm, 1,030 mm, and 1,118 mm) |
| Maximum outside diameter of roll paper | 170 mm | ✓ | | 150 mm |
| Maximum printable paper roll length | Roll: 18 m (varies according to the OS, RIP, and application used) | | | 18 m |
| Maximum printable cut-sheet media length | 2,133.6 mm | | | INA |
| Maximum media thickness | Roll/cut: 0.07-0.8 mm | | | Roll: 0.08-0.5 mm; Cut: 0.08-1.5 mm |
| Maximum media width | 44 inches | | | 44 inches |

| | Canon imagePROGRAF GP-4000 | Advantage | | Epson SureColor SC-P9500 |
|---|---|---|---|---|
| Media loading | Front | | | Top Rear |
| Roll paper | Multifunction Roll System (dual roll and/or bi-directional auto Take up configuration) | ✓ | | Single Roll |
| Optional media handling | Roll holder set (supports 2" and 3" media cores) | | | Roll media adapter (supports and 2” and 3” media core) |
| Standard RAM | 3 GB | ✓ | | 2 GB |
| Maximum RAM | 3 GB | ✓ | | 2 GB |
| Hard drive | Standard self-encrypting 500-GB | ✓ | | Optional self-encrypting 320-GB |
| Interface | Hi Speed USB; 10/100Base-TX/1000Base-T/TX; Wireless LAN: 802.2.11 b/g/n | ✓ | | 100Base-TX/1000Base-T, Super-speed USB 3.0 |
| PDL | PDF Ver. 1.7; JPEG (Ver. JFIF 1.02) | | | ESC/P-R (optional Adobe PostScript 3) |
| Net weight (unpacked) and size | 124 kg 1,593 x 984 x 1,168 mm (W x D x H; basket open) | ✓ | | 153.8 kg 1,909 x 2,211 x 1,218 mm (W x D x H; basket open) |
| Power consumption when in standby | 2.0 W or less | ✓ | | 3.4 W or less |
| Power consumption when active | 99 W or less | ✓ | | 110 W or less |
| Acoustic pressure | Operation: 49 dB (A) or less | | | Operation: 49.5 dB (A) or less |
| Acoustic power | Operation: 6.6 Bels | ✓ | | Operation: 7.5 Bels |
| Option to integrate with a spectrophotometer? | No | | ✓ | Optional SpectroProofer with X-rite ILS30EP |

INA – Information not available

# Driver Feature Set

| | Canon imagePROGRAF GP-4000 | Advantage | | Epson SureColor SC-P9500 |
|---|---|---|---|---|
| Speed settings | Standard, High, Highest, and Custom (with various settings depending on media selection) | | | Quality, High Quality, Max Quality, and Quality Options (with various settings from Speed to Quality available) |
| Economy mode | Yes (Custom Fast) | | | Yes (High Speed) |
| Predefined profiles | 5 available under Easy Settings: Default; Poster; Poster (Fluores-cent); Poster (Fluorescent Spot Color); Poster (Color) | | | 5 (Photo, Fine Art, Proofing, Poster, and Other (2Page N-up)) with the ability to program more |
| Overview of profile settings provided | Yes | | | Yes |
| Media profiles | 54 | ✓ | | 33 |
| IQ optimized for various types of output | Yes | | | Yes |
| Watermark | Yes | ✓ | | No |
| Sharpen text | No | | ✓ | Yes (called Finest Detail) |
| Thicken fine lines | Yes | | | Yes (called Finest Detail) |
| Mirror image | Yes | | | Yes |
| Multi-up printing | Yes (2 to 16) | ✓ | | Yes (2 to 4) |
| Poster print mode | Yes (2 by 2) | | ✓ | Yes (4 by 4) |
| Page stamping | Yes (Under Layout and Page Options: Date, Time, User Name, Page Number) | | ✓ | Yes (Document Name, User Name, Printer Name, Free Text Field, Media Type, Print Quality Level, Level, Print Mode, High Speed, Finest Detail, Edge Smoothing, Colour Adjustment, Colour Adj. Value, Colour Density) |
| Image rotation | Yes, 90 degrees and 180 degrees | ✓ | | Yes, 180 degrees |
| Option to preview before print | Yes | | | Yes |
| Link to device web server from driver | Yes (via link to Status Monitor) | ✓ | | No (there is a |
| CMYK balance adjustment | Yes (CMY only) | | | Yes (CMY only) |
| Brightness adjustment | Yes | | | Yes |

| | Canon imagePROGRAF GP-4000 | Advantage | | Epson SureColor SC-P9500 |
|---|---|---|---|---|
| Contrast adjustment | Yes | | | Yes |
| Saturation adjustment | No | | ✓ | Yes |
| Advanced colour management options | Yes (ability to edit fluorescent spot colours in PosterArtist Lite) | | | Yes |
| Enlargement Copy Mode | Yes | | | Yes |
| Free Layout Capability | Yes (flexible placement) | | | Yes (flexible placement via Layout Manager) |
| MS Office Plug-in | Yes | | | Yes |
| Adobe Photoshop Plug-in* | Yes | | | Yes |
| Accounting Capability | Yes | | | Yes |
| Disable automatic cutter | Yes | | | Yes |
| Unidirectional printing selection option | Yes | ✓ | | No |
| Integration with MFP | Yes | | | INA |

*** The Canon GP-4000 supports PosterArtist Lite and Professional Print & Layout (PPL) workflow software, which is designed to accentuate details in highlight areas and make in-focus areas stand out. It can be used as a standalone RIP or as an export module from industry-standard editing and graphics software such as Adobe Photoshop, Adobe Lightroom, as well as Canon Digital Photo Professional. The Epson unit supports Epson Print Layout which has a plug-in function for Adobe Photoshop and Adobe Lightroom, as well as Nikon ViewNX-I, Nikon NX Studio, and SILKYPIX.**

# Ink Consumption

## Table 1: Approximate Amount of Ink in Each Canon imagePROGRAF GP-4000 700-ml Cartridge (in Grams)

| | M | O | V | Y | PBK | R | MBK | GY | G | FP | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight of cartridge prior to installation | 949.1 | 935 | 934.2 | 936.9 | 935.3 | 935.6 | 948.4 | 934.1 | 941.7 | 936.2 | 949.6 |
| Weight of cartridge at end of life | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 | 206.3 |
| Net weight of ink | 742.8 | 728.7 | 727.9 | 730.6 | 729.0 | 729.3 | 742.1 | 727.8 | 735.4 | 729.9 | 743.3 |
| **Total ink weight across 11 cartridges** | | | | | | | | | | | 8,066.8 |

## Table 2: Approximate Amount of Ink in Each Epson SureColor SC-P7500 350-ml Cartridge (in Grams)

| | GY | VM | O | PBK | VLM | LGY | LC | Y | G | MBK | V | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Weight of cartridge prior to installation | 498.2 | 510.3 | 499.9 | 499.5 | 498.6 | 496.0 | 497.7 | 497.5 | 501.5 | 504.3 | 498.0 | 499.3 |
| Weight of cartridge at end of life | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 | 139.6 |
| Net weight of ink | 358.6 | 370.7 | 360.3 | 359.9 | 359.0 | 356.4 | 358.1 | 357.9 | 361.9 | 364.7 | 358.4 | 359.7 |
| **Total ink weight across 12 cartridges** | | | | | | | | | | | | 4,325.6 |

## Table 3: Ink Used in Three 50-Page Runs of Packaging Proof Test Document (High Mode) on the Canon imagePROGRAF GP-4000 (in Grams)

| | M | O | V | Y | PBK | R | MBK | GY | G | FP | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 4.9 | 5.5 | 5.8 | 6.4 | 32.0 | 7.5 | 7.1 | 31.0 | 6.8 | 14.4 | 6.5 |
| Test Run 2 Net weight of ink used | 4.7 | 6.0 | 5.7 | 6.3 | 30.7 | 7.8 | 6.5 | 30.3 | 6.1 | 14.7 | 7.1 |
| Test Run 3 Net weight of ink used | 4.8 | 5.3 | 5.2 | 6.7 | 32.4 | 7.7 | 6.7 | 29.9 | 5.7 | 16.1 | 7.4 |
| Average amount of ink used across three runs | 4.8 | 5.6 | 5.6 | 6.5 | 31.7 | 7.7 | 6.8 | 30.4 | 6.2 | 15.1 | 7.0 |
| **Total ink weight across 11 cartridges for 50-page run (based on averages)** | | | | | | | | | | | 127.4 |

## Table 4: Ink Used in Three 50-Page Runs of Packaging Proof Test Document (High Quality Mode) on the Epson SureColor SC-P9500 (in Grams)

| | GY | VM | O | PBK | VLM | LGY | LC | Y | G | MBK | V | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 10.7 | 20.1 | 10.9 | 21.0 | 32.6 | 73.1 | 35.3 | 16.6 | 5.3 | 2.3 | 4.6 | 8.5 |
| Test Run 2 Net weight of ink used | 10.5 | 20.5 | 10.8 | 21.3 | 31.5 | 72.3 | 35.7 | 16.7 | 5.4 | 2.0 | 3.7 | 7.1 |
| Test Run 3 Net weight of ink used | 10.5 | 20.2 | 11.7 | 21.0 | 31.3 | 72.1 | 35.8 | 16.2 | 6.4 | 1.9 | 3.3 | 7.2 |
| Average amount of ink used across three runs | 10.6 | 20.3 | 11.1 | 21.1 | 31.8 | 72.5 | 35.6 | 16.5 | 5.7 | 2.1 | 3.9 | 7.6 |
| **Total ink weight across 12 cartridges for 50-page run (based on averages)** | | | | | | | | | | | | **238.8** |

## Table 5: Ink Used in Three 50-Page Runs of Retail Sales Poster Test Document (High mode) on the Canon GP-4000 (in Grams)

| | M | O | V | Y | PBK | R | MBK | GY | G | FP | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 14.5 | 7.5 | 19.8 | 8.0 | 17.4 | 21.3 | 9.4 | 29.1 | 8.8 | 11.0 | 15.0 |
| Test Run 2 Net weight of ink used | 13.9 | 8.5 | 19.1 | 8.2 | 17.2 | 21.7 | 9.0 | 29.7 | 8.9 | 10.7 | 15.3 |
| Test Run 3 Net weight of ink used | 14.4 | 7.4 | 19.6 | 8.2 | 17.2 | 21.5 | 9.3 | 29.4 | 8.9 | 10.9 | 15.3 |
| Average amount of ink used across three runs | 14.3 | 7.8 | 19.5 | 8.1 | 17.3 | 21.5 | 9.2 | 29.4 | 8.9 | 10.9 | 15.2 |
| **Total ink weight across 11 cartridges for 50-page run (based on averages)** | | | | | | | | | | | **162.1** |

## Table 6: Ink Used in Three 50-Page Runs of Retail Sales Poster Test Document (High Quality Mode) on the Epson SureColor SC-P9500 (in Grams)

| | GY | VM | O | PBK | VLM | LGY | LC | Y | G | MBK | V | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 6.7 | 24.7 | 17.7 | 3.9 | 52.4 | 38.7 | 21.5 | 10.4 | 16.5 | 8.7 | 14.1 | 4.9 |
| Test Run 2 Net weight of ink used | 6.7 | 24.5 | 17.8 | 3.4 | 52.4 | 38.3 | 21.2 | 10.2 | 16.7 | 8.9 | 14.4 | 4.7 |
| Test Run 3 Net weight of ink used | 6.5 | 24.7 | 17.7 | 3.1 | 52.2 | 39.2 | 21.1 | 10.1 | 16.6 | 8.6 | 15.3 | 4.7 |
| Average amount of ink used across three runs | 6.6 | 24.6 | 17.7 | 3.5 | 52.3 | 38.7 | 21.3 | 10.2 | 16.6 | 8.7 | 14.6 | 4.8 |
| **Total ink weight across 12 cartridges for 50-page run (based on averages)** | | | | | | | | | | | | 219.6 |

## Table 7: Ink Used in Three 50-Page Runs of Studio Portrait Test Document (High mode) on the Canon GP-4000 (in Grams)

| | M | O | V | Y | PBK | R | MBK | GY | G | FP | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 5.0 | 6.1 | 5.7 | 6.3 | 15.0 | 7.3 | 10.4 | 50.3 | 5.5 | 4.6 | 4.9 |
| Test Run 2 Net weight of ink used | 5.2 | 6.1 | 5.8 | 6.8 | 14.8 | 7.7 | 11.4 | 51.6 | 5.9 | 7.2 | 4.5 |
| Test Run 3 Net weight of ink used | 4.8 | 6.3 | 5.4 | 6.9 | 14.5 | 7.3 | 11.8 | 51.7 | 5.9 | 7.2 | 4.4 |
| Average amount of ink used across three runs | 5.0 | 6.2 | 5.6 | 6.7 | 14.8 | 7.4 | 11.2 | 51.2 | 5.8 | 6.3 | 4.6 |
| **Total ink weight across 11 cartridges for 50-page run (based on averages)** | | | | | | | | | | | 124.8 |

### Table 8: Ink Used in Three 50-Page Runs of Studio Portrait Test Document (High Quality mode) on the Epson SureColor SC-P9500 (in Grams)

| | GY | VM | O | PBK | VLM | LGY | LC | Y | G | MBK | V | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 12.6 | 9.1 | 8.4 | 10.6 | 32.6 | 143.8 | 25.8 | 9.2 | 9.5 | 5.0 | 4.7 | 6.3 |
| Test Run 2 Net weight of ink used | 14.5 | 9.9 | 8.1 | 11.6 | 33.2 | 143.7 | 26.8 | 11.4 | 8.9 | 5.8 | 4.2 | 7.5 |
| Test Run 3 Net weight of ink used | 19.7 | 6.0 | 6.7 | 9.2 | 29.6 | 139.6 | 23.2 | 15.8 | 7.8 | 3.1 | 4.3 | 3.8 |
| Average amount of ink used across three runs | 15.6 | 8.3 | 7.7 | 10.5 | 31.8 | 142.4 | 25.3 | 12.1 | 8.7 | 4.6 | 4.4 | 5.9 |
| **Total ink weight across 12 cartridges for 50-page run (based on averages)** | | | | | | | | | | | | 277.3 |

# Supplementary Borderless Poster Ink Consumption Test Consumption

### Table 9: Ink Used in Three 50-Page Runs of Studio Portrait Test Document (High mode) on the Canon GP-4000 (in Grams)

| | M | O | V | Y | PBK | R | MBK | GY | G | FP | C |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 5.4 | 6.6 | 8.6 | 6.4 | 10.2 | 5.2 | 6.4 | 59.6 | 6.9 | 6.1 | 6.0 |
| Test Run 2 Net weight of ink used | 5.3 | 6.4 | 8.7 | 6.8 | 10.6 | 5.0 | 6.5 | 59.3 | 6.9 | 6.2 | 6.1 |
| Test Run 3 Net weight of ink used | 5.2 | 6.3 | 8.7 | 6.8 | 10.3 | 5.1 | 6.5 | 59.9 | 6.7 | 6.0 | 6.4 |
| Average amount of ink used across three runs | 5.3 | 6.4 | 8.7 | 6.7 | 10.4 | 5.1 | 6.5 | 59.6 | 6.8 | 6.1 | 6.2 |
| **Total ink weight across 11 cartridges for 50-page run (based on averages)** | | | | | | | | | | | 127.8 |

### Table 10: Ink Used in Three 50-Page Runs of Studio Portrait Test Document (High Quality mode) on the Epson SureColor SC-P9500 (in Grams)

| | GY | VM | O | PBK | VLM | LGY | LC | Y | G | MBK | V | C |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Test Run 1 Net weight of ink used | 13.7 | 9.7 | 9.6 | 11.5 | 33.9 | 145.8 | 27.0 | 10.7 | 10.5 | 5.4 | 5.3 | 6.8 |
| Test Run 2 Net weight of ink used | 12.8 | 9.6 | 9.7 | 11.6 | 32.9 | 145.2 | 27.5 | 10.1 | 11.2 | 5.6 | 5.2 | 6.5 |
| Test Run 3 Net weight of ink used | 13.2 | 9.7 | 9.1 | 11.4 | 33.6 | 144.8 | 27.6 | 10.9 | 10.6 | 5.7 | 5.8 | 6.7 |
| Average amount of ink used across three runs | 13.2 | 9.7 | 9.5 | 11.5 | 33.5 | 145.3 | 27.4 | 10.6 | 10.8 | 5.6 | 5.4 | 6.7 |
| **Total ink weight across 12 cartridges for 50-page run (based on averages)** | | | | | | | | | | | | 289.2 |

# Ink Consumption Test Methodology Overview

Keypoint Intelligence's ink consumption analysis was conducted using three document types (Packaging Proof, Retail Sales Poster and Studio Portrait). The Packaging Proof document was formatted as a PDF, the Retail Sales Poster as a JPG, and the Studio Portrait was formatted as a TIFF file; all documents were sized at ISO A1.

The Canon imagePROGRAF GP-4000 was installed in Keypoint Intelligence's lab with the latest "01.01" level of firmware (as of November 2021) and connected to a Windows 10 workstation using a 1000BaseT TCP/IP connection. The device was left in default configuration throughout testing. The Canon imagePROGRAF Printer Driver was used for all testing and was left in default colour setting configuration. The Packaging Proof document was printed on Canon proofing medium weight media in High mode. The Retail Poster was printed on 140gsm matte coated media in High mode, and the Studio Portrait photo was printed on 280gsm semi-gloss photo media in High mode.

The Epson SureColor SC-P9500 was installed in Keypoint Intelligence's lab with the latest "LL21L7" level of firmware (as of November 2021) and connected to a Windows 10 workstation using a 1000BaseT TCP/IP connection. The device was left in default configuration throughout testing. The Epson ESC/P-R driver was used for all testing and was left in default colour setting. The Packaging Proof document was printed on proofing paper commercial media in High Quality mode. The Retail Poster was printed on doubleweight matte coated media in High Quality mode, and the Studio Portrait photo was printed on Epson 250gsm semi-gloss photo media in High Quality mode.

Before installing the ink cartridges, lab technicians weighed and recorded the weight of each with all packaging removed. At the end of each 50-print test run, the cartridges were weighed again and the resulting weight of ink used for the test run calculated for each colour. To ensure that the sub-tank on the Canon model did not affect results, a procedure was followed to ensure that the sub-tank level was at its maximum before the print run commenced and again after the print run was completed, thereby ensuring that ink replenishment of the sub-tanks was taken into account for each print run.

For both models, one cartridge was then run to exhaustion and the weight of the empty cartridge was recorded.

**Test Environment** Products were tested in Keypoint Intelligence's environmentally controlled UK test lab, which replicates typical office conditions.

**Test Equipment** Keypoint Intelligence's dedicated test network in Europe, consisting of Windows 2012 servers and Windows 10 Professional workstations, 10/100/1000BaseTX network switches and CAT5e/6 cabling.

**Test Procedures**

The test methods and procedures employed by Keypoint Intelligence in its lab testing include Keypoint Intelligence's proprietary procedures and industry-standard test procedures. In addition to a number of proprietary test documents, BLI uses industry standard files including a Keypoint Intelligence test file and an ASTM monochrome test document for evaluating black image quality. In addition to a visual observation, colour print quality and gamut size are evaluated using XRite i1 profile software and an i1 Pro colour spectrophotometer, and analysed using XRite i1i0 Advanced Scanning Table. Density of black and colour output was measured using XRite 508 and XRite exact$^{Xp}$ densitometers.

## About Keypoint Intelligence

For almost 60 years, clients in the digital imaging industry have relied on Keypoint Intelligence for independent hands-on testing, lab data, and extensive market research to drive their product and sales success. Keypoint Intelligence has been recognized as the industry's most trusted resource for unbiased information, analysis, and awards due to decades of analyst experience. Customers have harnessed this mission-critical knowledge for strategic decision-making, daily sales enablement, and operational excellence—improving business goals and increasing bottom lines. With a central focus on clients, Keypoint Intelligence continues to evolve as the industry changes by expanding offerings and updating methods, while intimately understanding and serving manufacturers', channels', and their customers' transformation in the digital printing and imaging sector.

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