

KPI Comparative Lab Test Report

JANUARY 2020

Canon imagePROGRAF PRO-6100S

vs. HP DesignJet Z6810

Advantage	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Image Quality	✓	
Print Productivity	=	=
Banner Printing	✓	
Ink Consumption	✓	
Direct Print Submission Functionality	✓	
Device Feature Set	✓	
Print Driver Feature Set	✓	
Printhead Reliability/Cleaning Routines	✓	

Test Objective

Keypoint Intelligence - Buyers Lab was commissioned by Canon Europe to conduct confidential wide format device performance testing on the Canon imagePROGRAF PRO-6100S and the HP DesignJet Z6810, and produce a report comparing the relative strengths and weaknesses of the two printers in terms of image quality, productivity, ink consumption, direct print submission functionality, device feature set, driver functionality, and printhead stability and cleaning routines. All testing was performed in Buyers Lab's European test facility in Wokingham, UK.

Executive Summary

The Canon imagePROGRAF PRO-6100S had the overall advantage in Buyers Lab's graphic arts lab evaluation, with first-class image quality, richer device and driver feature sets, and lower ink consumption in two of the three test scenarios. Although there were mixed results in the round of productivity assessments, the PRO-6100S successfully printed Buyers Lab's proprietary banner image, unlike the HP model which couldn't handle the file at all. Printhead reliability was also in the Canon unit's favour; while both models' printheads performed reliably throughout the evaluation, when powered off for a weekend, the PRO-6100S experienced no nozzle clogging issues unlike the HP model's printhead which required a clean cycle to rectify its clogged nozzles. Image quality produced by both 60-inch printers in the highest quality mode, was entirely congruous with the standard expected of models that are designed for photographic and graphical printing applications. Yet, the Canon PRO-6100S had the overall edge with better fine detailing in highlight areas, better depth of field, and more natural-looking skin tones. Text and fine line reproduction surpassed that of the HP model, as well, exhibiting none of the overspray that was observed on the HP unit's output. Both models exhibited an equally low Delta E mean colour drifts when FOGRA39 colour patches were compared before and after their respective productivity and ink consumption tests. Canon's latest generation PRO-6100S offers numerous features that boost usability and efficiency, including improved automatic media loading, automatic media identification and tracking abilities without the need to print a media barcode, the ability to print via a USB flash device and from smart devices, borderless print capabilities, wireless connectivity, a standard dual roll design that operates with auto take-up to facilitate longer unattended workflows, as well as Canon's hallmark hot-swap ink tank design, which lets users replace empty inks while the device is still actively printing. In contrast, when the HP DesignJet Z6810 runs out of ink, printing has to stop for the cartridge to be replaced, which leads to operator downtime. Both models come with a 500-GB hard drive to aid job storage and offer strong direct print submission functionality, although Canon has the overall edge with its new Professional Print & Layout utility which offers extensive image adjustment features and flexible layout nesting to help users save on paper. The HP Z6810 comes with larger ink cartridge capacities, auto take-up function, HP Professional PANTONE Emulation, which allows users to create and print a swatchbook of multiple PANTONE colours and see how the printer will reproduce them on selected media, and an inline X-Rite i1 spectrophotometer to provide more precise colour management control. While the Canon PRO-6100S does not offer this as an option, the device comes with standard calibration features used for both the manufacturer's own-brand of genuine paper, as well as other media brands. All things considered, the Canon PRO-6100S is the stronger performer in Buyers Lab's large-format evaluation. Not only did it deliver first-class photographic image quality, it handled Buyers Lab's banner test successfully (which the HP failed to output), and its driver and device feature sets are richer, providing many ways to boost productivity and enhance functionality.

Image Quality

Advantage	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
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.

Buyers Lab's image quality test evaluation was conducted using Canon's Premium Semi-gloss Photo 280gsm media and HP's Instant-Dry Satin Photo Paper 260gsm media, with quality set to Highest on the Canon model and the HP model set to Best.

- + As would be expected of two models aimed at the Graphic Arts (GA) marketplace, both units delivered a very high standard of output in colour appropriate for any poster and photo printing application. However, the Canon PRO-6100S delivered superior quality overall, with finer detailing in light contrast areas and better depth of field.
- + The Canon model produced cleanly formed and pin-sharp fonts in both black and colour that were fully formed down to the 4-pt type size in serif and rated very good, and 3-pt. level in sans serif with no bleed observed and rated excellent. The HP Z6810 delivered serif and sans serif fonts in colour that were legible down to the 6-pt. and 5-pt. level, respectively, and rated good (serif) and very good (sans serif). While fonts were legible to the 3-pt. type size in black, they lacked crispness due to overspray and were rated good.
- + The Canon PRO-6100S delivered very good crisp vertical and horizontal fine lines down to 0.1-pt size in both black and colour. Fine lines produced by the HP model were less distinct due to overspray and were rated good.
- + Circles produced by the Canon unit were smooth, clean, and distinct at the 0.1-pt. level, and judged very good. The HP Z6810's circles at the 0.25-pt. level in colour and 0.1-pt. in black suffered from slight fuzziness, and were rated good.
- + The Canon unit produced excellent CMY and black-on-white 1x1 pixel grids with no quality issues; the HP model delivered intact 1x1 pixel grids as well, but dot formation was judged slightly less uniform and clear than those of the Canon device.
- 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.

- Both models delivered an impressive range of halftone fills in colour mode, with no graininess issues. Neutral greyscale halftone coverage was equally good from both units.
- + The Canon PRO-6100S produced higher optical densities for cyan, magenta, and yellow colours compared with those from the HP Z6810, while the HP unit had slightly higher black optical densities.
- The three skin tone tests yielded fairly consistent results for each model when compared with the original target. Output produced by the Canon model displayed fractionally greater variance with all three skin shades when compared with HP model, however, overall there's no meaningful real-world difference that would be discernible to the naked eye.
- Neutral grey consistency was maintained well by both models, with an equally low variance across the page indicated by low Delta E values.
- During Buyers Lab's colour drift analysis, in which the FOGRA39 media wedge is submitted to print before and after productivity and ink consumption tests, and measured using EFI Color Verifier software, both models displayed comparably low mean Delta E drifts—1.7 for the Canon unit and 1.3 for the HP device.
- + When printing on photo media in highest quality settings, the Canon PRO-6100S delivered a 5.4% larger colour gamut, with a 637,303 CIE volume versus 604,676 CIE volume for the HP model.
- + Buyers Lab technicians analysed a wide range of colour and greyscale images output by both devices and found them to be of an exceptionally high standard, with equally vibrant colour and smooth tonal transitions. However, the Canon PRO-6100S had better fine detailing in highlight areas and better depth of field, while greyscale images produced on the HP Z6810 were slightly flat.
- + Both models produced smooth skin tones in photographic images, but they were slightly darker and less natural-looking on the HP Z6810's output.

Print Productivity

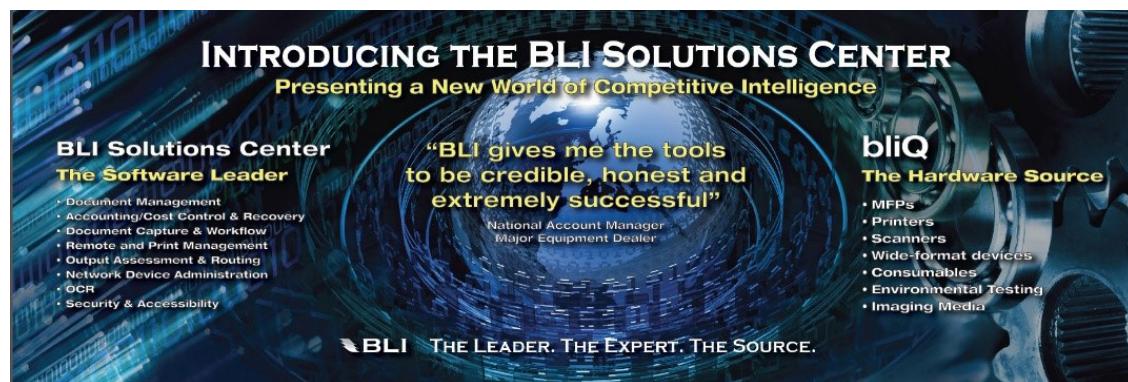
Advantage	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
First Print Out From Ready State Portrait Printing		✓
First Print Out From Ready State Retail Poster Printing	✓	
Throughput Speed Portrait Printing on Semi-Gloss		✓
Throughput Speed Retail Poster on Matte Coated	✓	

Productivity evaluation is based on Fast and Standard/Normal modes only.

- In the first-print-out from ready state assessment, the Canon PRO-6100S was slower than the HP Z6810 when printing a single high-resolution portrait. In Fast mode, it was 19.9% slower than the HP unit, and 33.0% slower in Standard/Normal mode when compared with the HP model.
- + When printing a single medium-resolution retail poster from ready state, the Canon PRO-6100S was faster by 22.3% in Fast mode when compared with the HP device, while both models' speeds were comparable in Standard/Normal mode.
- In Buyers Lab's A1 throughput speed evaluation, the Canon model's per-page speed was 7.1% faster than the HP model when printing five copies of a single-page A1-size high-resolution portrait test document in Fast mode. However, in Standard/Normal mode, the PRO-6100S's per-page speeds were 22.1% slower when compared with the HP model.
- + When printing five copies of a single-page A1-size medium-resolution retail poster test document, the Canon model's per-page speeds were faster by 31.7% in Fast mode and 19.4% in Standard/Normal mode when compared with the HP DesignJet Z6810.
- In Buyers Lab's A0 throughput speed evaluation, which involves printing five copies of a single-page A0-size high-resolution portrait test document, the Canon model's per-page speeds were 6.6% slower in Fast mode and 27.2% slower in Standard/Normal mode when compared with the HP model.
- + When printing five copies of a single-page A0-size medium-resolution retail poster test document, the Canon model's per-page speeds were faster by 29.4% in Fast mode and 16.8% faster in Standard/Normal mode when compared with the HP DesignJet Z6810.

Banner Printing

Advantage	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Image Quality	✓	
Productivity	✓	



Buyers Lab's Banner Test File

- + The Canon PRO-6100S successfully printed Buyers Lab's 36" x 105" banner (a 4,955-KB PDF file) in Fast mode, taking 38.86 seconds to generate a preview at the desktop, and an additional four minutes, 42.58 seconds from preview to final paper cut. In contrast, while the HP Z6810 offers a preview, it was unable to print any portion of the banner.

Ink Consumption

Buyers Lab 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 Buyers Lab 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)

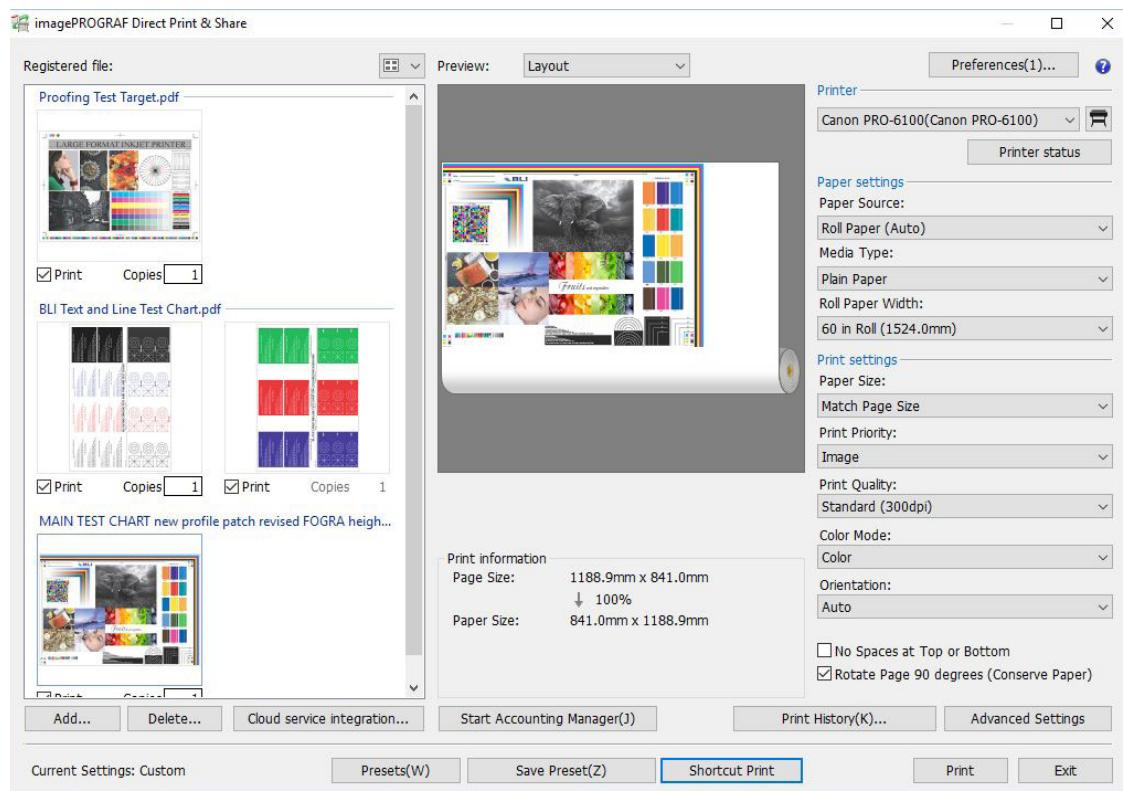
	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Packaging Proof	130.3	132.5
Retail Sales Poster	109.0	122.3
Studio Portrait	127.1	116.1

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

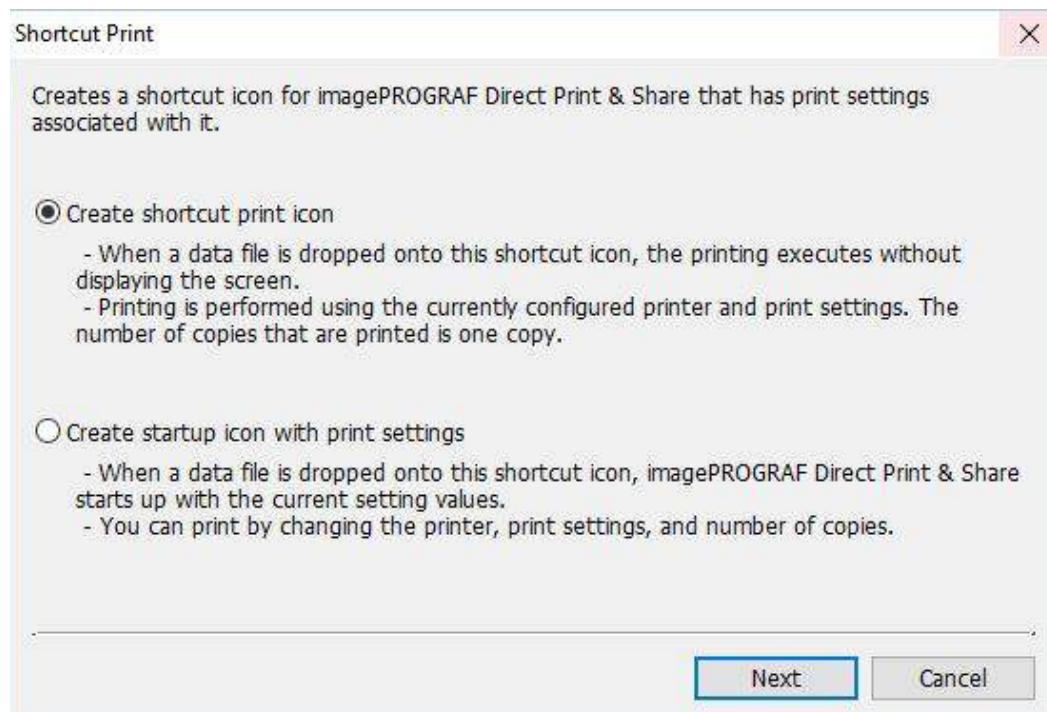
- In terms of total ink across a set of eight colour cartridges, Canon provides approximately 8.1% less ink per new cartridge set than does HP (5,971.2 grams vs. 6,496.0 grams).
- + When printing Buyers Lab's Packaging Proof test target in Standard/Normal mode on semi-gloss proofing media, the Canon PRO-6100S used fractionally less (by 1.7%) ink in terms of net weight than the HP Z6810.
 - For the same print scenario, the Canon PRO-6100S used 2.2% of its total available ink, while the HP model used 2.0%.
- + When printing Buyers Lab's Retail Sales Poster test target in Standard/Normal mode on matte coated media, the Canon unit used 10.9% less ink than the HP DesignJet Z6810 did.
 - For the same print scenario, the Canon PRO-6100S used 1.8% of its total available ink, while the HP model used 1.9%.
- When printing Buyers Lab's Studio Portrait test target in Standard/Normal mode on semi-gloss photo media, the Canon unit used 9.5% more ink than the HP Z6810 did.
- For the same print scenario, the Canon PRO-6100S used 2.1% of its total available ink, while the HP model used 1.8%.

Direct Print Submission Functionality

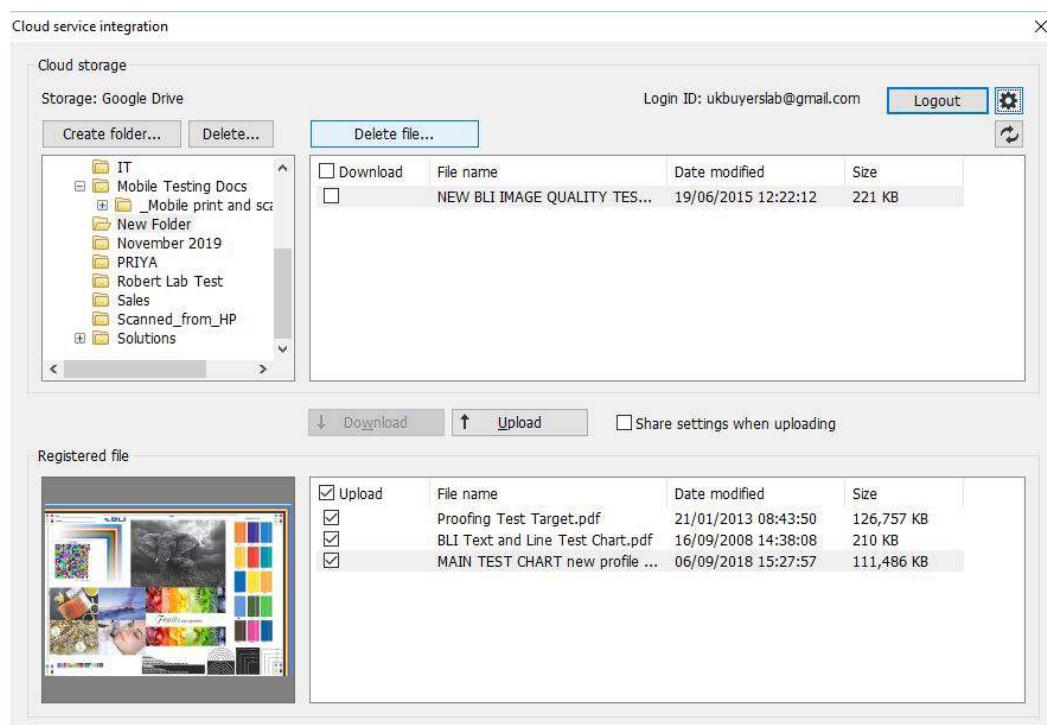
Advantage	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Ease of Use	=	=
Direct Print Submission Functionality	✓	
Mobile App Integration	✓	



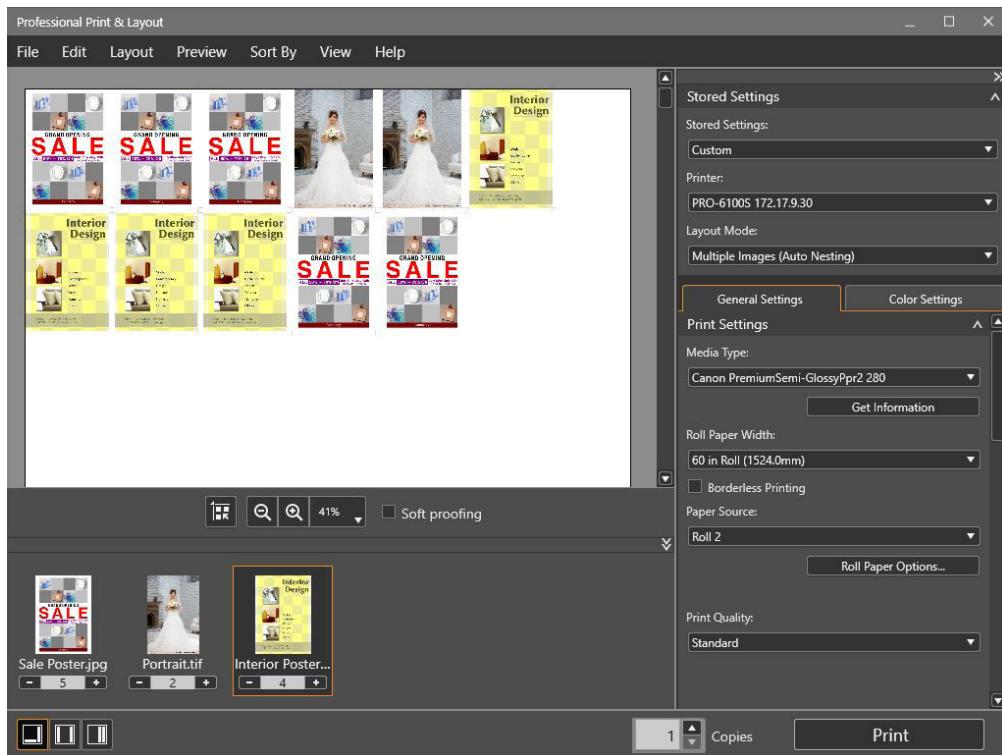
Available as a free download from Canon's website, imagePROGRAF Direct Print & Share utility enables the direct printing of PDF, JPEG, TIFF, and HPGL/2 files without the need for native applications or print drivers. Users can preview print layouts, view thumbnail images of multiple print jobs, and select print settings directly within the utility, as well as modify and print multiple files simultaneously. Additional benefits provided by imagePROGRAF Direct Print & Share include quick and easy printing of jobs selected from the print history log using the same settings as when last printed; the ability to view printer and consumables status via a link to Status Monitor before sending jobs to print; and the option to insert a divider sheet in between jobs when outputting multiple files simultaneously for easier identification.



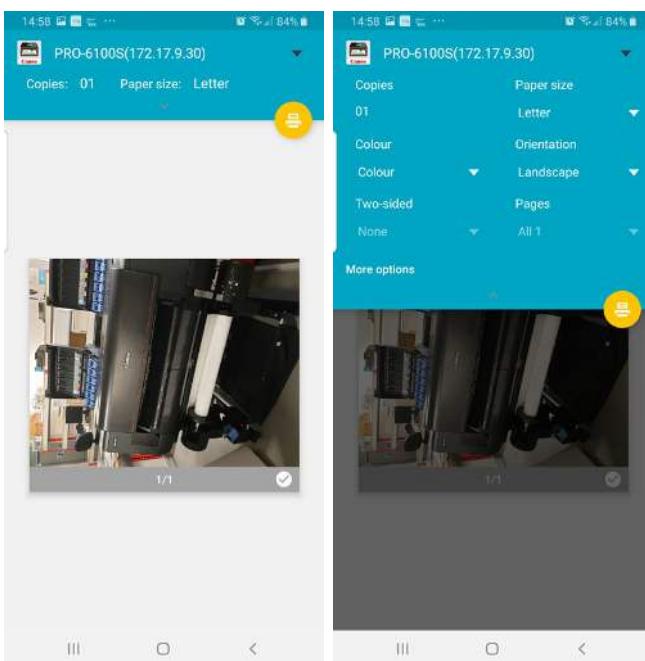
To help standardize and streamline common print workflows, imagePROGRAF Direct Print & Share supports “Shortcut Print” functionality. Akin to a hot folder workflow, users can create desktop shortcuts that allow drag and drop automatic file printing with predefined print settings, including output printer, print quality, paper type, and paper size. Multiple desktop icons can be created that contain different print settings or combinations of print settings. In addition, users can register and save new job presets in the utility to expedite daily routine workflows.



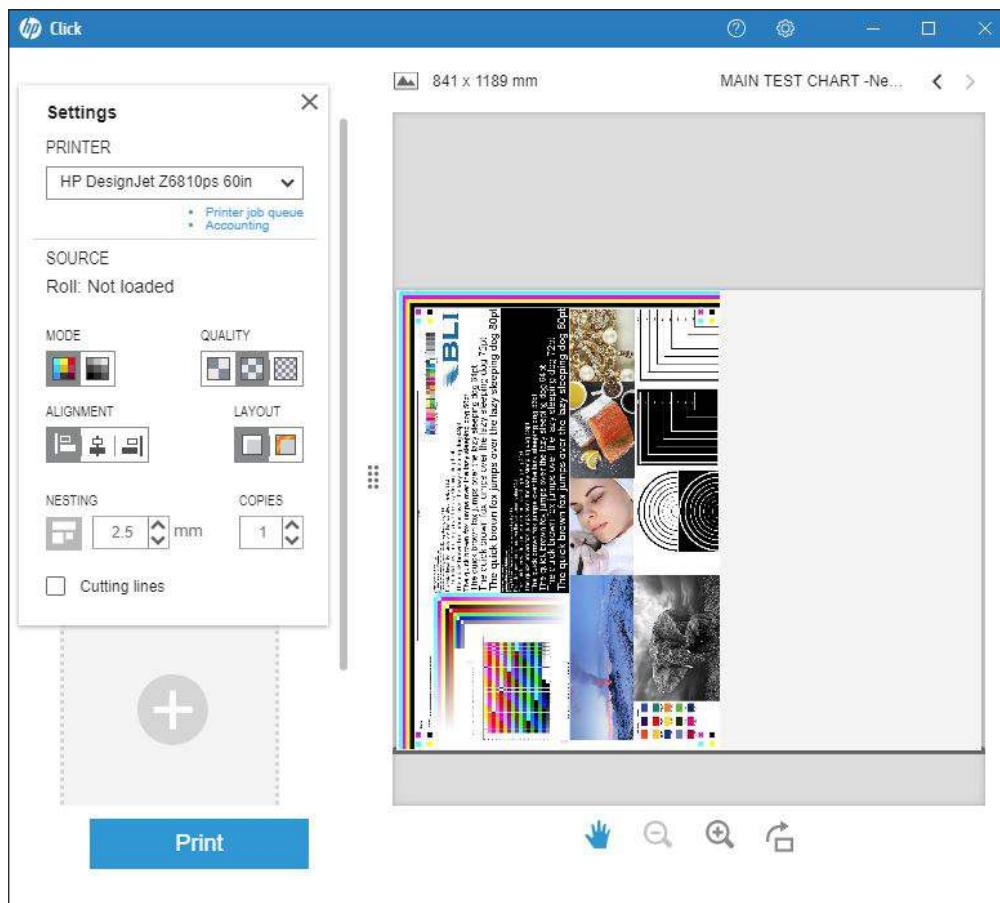
Canon imagePROGRAF Direct Print & Share lets users download stored files from Google Drive and AutoCAD 360 cloud storage services for printing, and enables the uploading of files directly to cloud storage for easier collaboration. For added convenience, the utility offers the option to share files simultaneously with one or more users (via Google Drive only), who will receive an email notification with a link to download the shared file without the need to log in.



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. Not only does it offer an auto nesting feature, but users can drag and drop images to desired locations and print them together on a single page, so paper is used more efficiently. The utility offers previews, soft proofing, and pattern printing, which enables users to check and adjust the colour balance, contrast, or brightness of their image by specifying a variation in instance and viewing the resulting 'pattern' to identify and select the desirable value. A range of job setting adjustments, including colour management, print quality, image rotation, amongst others, can be performed, as well. The utility has a plug-in function which offers support for a variety of 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 Service mobile print plugin is an easy way for Android users to print wirelessly to the PRO-6100S 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. For iPad users, PRO Gallery Print is a free dedicated mobile app for Canon's PRO series, that lets users print JPEG files stored on their iPads, or via photographers' web services such as SmugMug and Zenfolio.



Similar to Canon's utility, HP Click printing software, which is also available as a free download, enables direct printing of PDF, JPEG, TIFF, and HPGL/2 files from the PC desktop, without the need for native applications or print drivers. Users can select basic print settings, preview, resize and align images without the need to open up the driver properties. The utility also has an automatic nesting feature to reduce waste (however, unlike the Canon tool, it does not allow users to have precise control over the positioning of jobs), and with select models (including the HP Designjet Z6810), users can access printer and print job status information via a link to the device's embedded web server.

- + Unlike the Canon PRO-6100S, there is no mobile print support available with the HP Z6810.

Device Feature Set

- + Both models employ an eight ink system. Canon inks are replaceable during operation, helping to reduce downtime for users, whereas HP's cartridges cannot be replaced during operation.
- Canon offers three replacement ink cartridge capacity options—160 ml, 330 ml, and 700 ml—for all colours, whilst the HP Z6810 offers a larger 775 ml cartridge capacity for all colours.
- + The Canon unit's ink delivery system dispenses a 4-picoliter drop size for all colours; the HP Designjet Z6810 model dispenses two drop sizes: 4-picoliter dual drop weight (LC, LG, LM, and PBK) and a 6-picoliter drop size (C, M, MK, Y).
- Both models utilize user-replaceable printheads, which are similarly straightforward to replace.

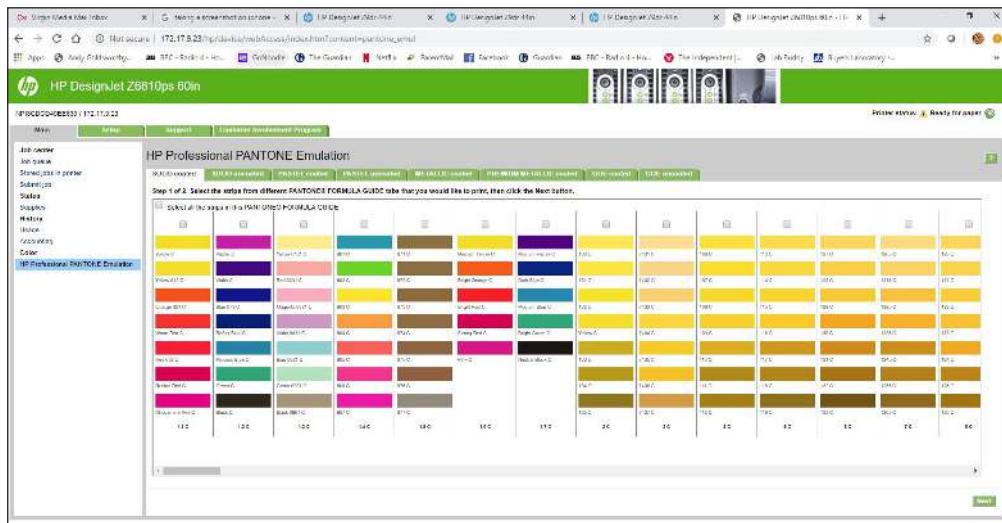
- + The Canon PRO-6100S offers improved automated media loading at the front of the device. Once the media roll holder is locked in place on the unit, the printer automatically feeds and loads the media, making the process easier and quicker, and minimizes user intervention. Built-in sensors allow the machine to automatically detect the media type and size so there's no need to confirm anything on the control panel. For the HP DesignJet Z6810, media rolls are loaded at the front but the operator must feed the paper edge into the machine until there is an audible beep, after which the printer will load the paper and perform checks such as for skew. To complete the process, the operator must confirm the media type on the control panel, unless the paper printing info option is enabled and the roll carries a paper-data barcode.
- + The Canon PRO-6100S has two sensors that are capable of measuring and estimating the remaining length available on the media roll, eliminating the need for the machine to print and read a barcode each time a partially-used roll is loaded and unloaded. This 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. The HP Z6810 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.
- + The Canon PRO-6100S supports borderless printing regardless of what media is being used, with a media sensor detecting the edges and automatically adjusting the margin; users can choose free size or three-sided borderless. The HP Z6810 does not support borderless printing.
- 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 HP device, users are provided with a warning directly in the print driver before the job is submitted, and a control panel warning appears after it is submitted. The HP Z6810 control panel's "Paper mismatch action" setting allows users either to put the job on hold (it will be kept in the printer queue until suitable paper is loaded) or print it anyway; all jobs that are slated for the paper type that is already loaded will print without delay.
- + Both models support Gigabit Ethernet connectivity, but the Canon PRO-6100S also offers a wireless interface (not matched by the HP Z6810).
- + The Canon PRO-6100S has an USB port (not available with the HP unit), enabling walk-up users to print PDF and JPEG files from USB flash drives and helps aid document portability.
- The HP Z6810 model comes with an inline Xrite i1 spectrophotometer as standard, for automated colour management and verification—an option that's not offered with the Canon model.
- However, the Canon PRO-6100S does have a built-in Color Calibration function which uses a multi-sensor to read colour density and automatically calibrate the printer with Canon media, as well as other media brands. Moreover, administrators can control colour and monitor the calibration status across the whole PRO-2100/6100S/6100S series via Canon's free Device Management Console utility to ensure colour consistency among all Canon devices. HP users can also track and control colour consistency across multiple devices via HP PrintOS Color Beat functionality, which is part of HP PrintOS, a cloud-based print production management system that includes multiple online and mobile apps to help HP customers better manage their operational environment.

- + The Canon model offers a standard, non-upgradable RAM capacity of 3 GB, while the HP unit has a standard non-upgradable RAM capacity of 1 GB (includes virtual memory).
- Both models come with a standard built-in 500-GB hard drive, which allows for the storage of commonly used documents and aids spooling workflow.
- + For maximum convenience and minimum downtime, the Canon model offers the advantage of a dual-roll design, giving users the added flexibility of switching between different media types or sizes without having to reload the media each time; the HP unit does not have this, even as an option.
- The PRO-6100S's standard 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. The HP Z6810 also offers a built-in Take-up roll system.
- The output catch baskets of both models are very simple designs which collect output from media rolls in a somewhat random order.
- + The Canon model is lighter (141 kg versus 195 kg) than the HP Z6810, plus it is more compact with a width of 1,999 mm versus 2,405 mm for the HP unit.
- + The PRO-6100S features a new 4.3-inch touchscreen control panel which is larger and better designed than its predecessor. From the home screen, operators can view printer, paper, and ink status easily. The HP unit's monochrome LCD display with hard button navigation controls offers straightforward walk-up operation; despite the clear user interface, it is more time-consuming to scroll through menus and make select setting selections.
- + The Canon PRO-6100S's power consumption while active is lower—103 watts versus 270 watts—than that of the HP model.
- + In standby mode (where it may spend more of its time) the Canon model's power consumption is lower (3.6 watts versus HP Z6810's <48 watts).

Print Driver Feature Set

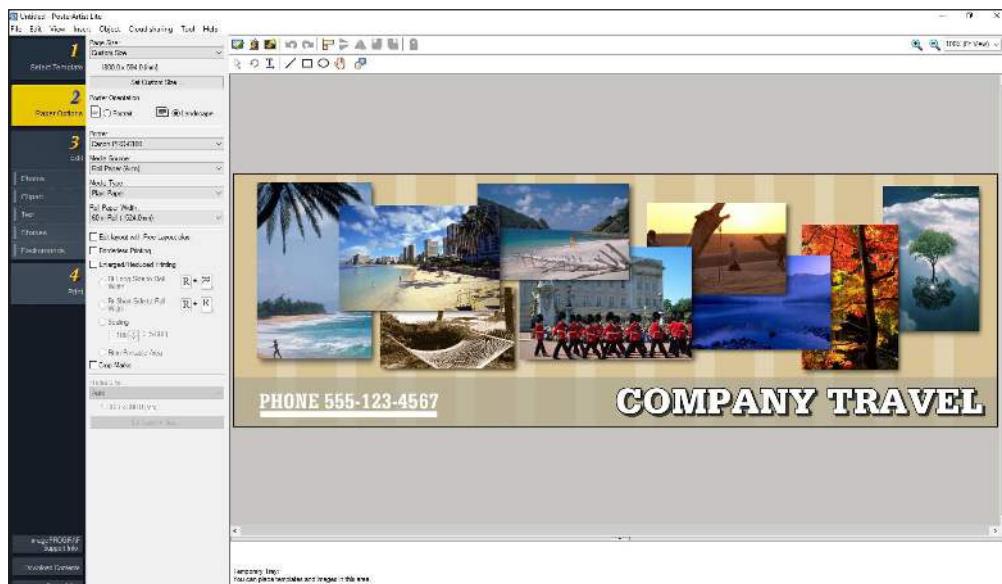
- + The Canon PRO-6100S has five speed settings, although not all of them are available with all media types. In contrast, the HP device has three settings (Fast, Normal, and Best).
- + The Canon driver includes 66 media profiles and the ability to create up to 10 custom options, versus 35 for the HP driver, which doesn't have a customization option.
- + The Canon driver includes a watermark capability; the HP driver does not.
- + The Canon driver offers N-up printing (16-up maximum), which is not supported by the HP unit.

- + Poster printing capability (2 x 2) is offered only by the Canon model, as is page-stamping (date, time, user-name and page number); neither feature is available with the HP HPGL/2 driver.
- Both models' drivers offer unidirectional printing, even in Fast mode, which helps to eliminate banding across output because the printhead travels in only one direction to create the desired image.
- The Canon driver has advanced colour-matching capabilities, including the ability to match colours using ICC profiles and select the rendering intent based on different elements in the document. The HP Color Center Utility offers the HP Easy Profiling feature, which enables users to build custom ICC colour profiles using the on-board spectrophotometer, and embed them in the HP Z6810 printer. Users can also re-profile existing media as well as new, third-party media.
- HP Professional PANTONE Emulation feature is highly beneficial for customers who require precise colour matching. Operators can create and print a swatchbook of multiple PANTONE colours, so that they can see just how accurately the printer will reproduce them on selected media. Canon does not offer such a feature.

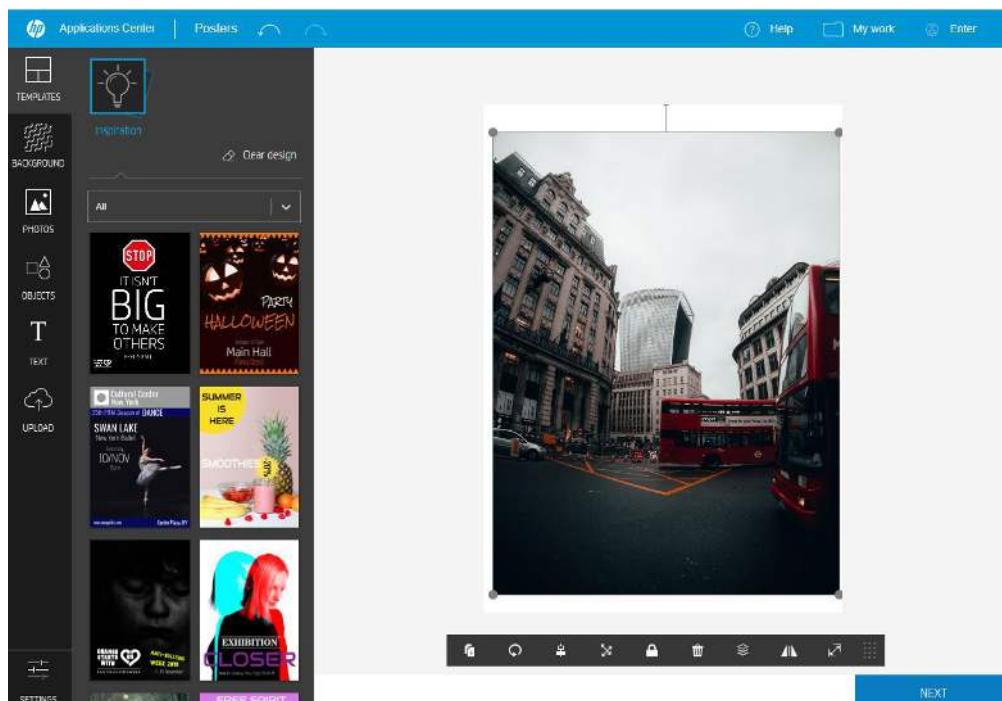


HP Professional PANTONE Emulation

- + The Canon driver includes a utility, Colour imageRUNNER Enlargement Copy Mode, which allows users to integrate a Canon MFP or other scanner with the PRO-6100S. Documents scanned by the Canon MFP are automatically routed to a hot folder, which is monitored by the PRO-6100S driver. Users can also set up other scanners to route files directly to the hot folder. The image is then resized and printed, offering a fast, easy-to-use poster creation tool for office users.
- + 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. No such plug-in is available to HP users.



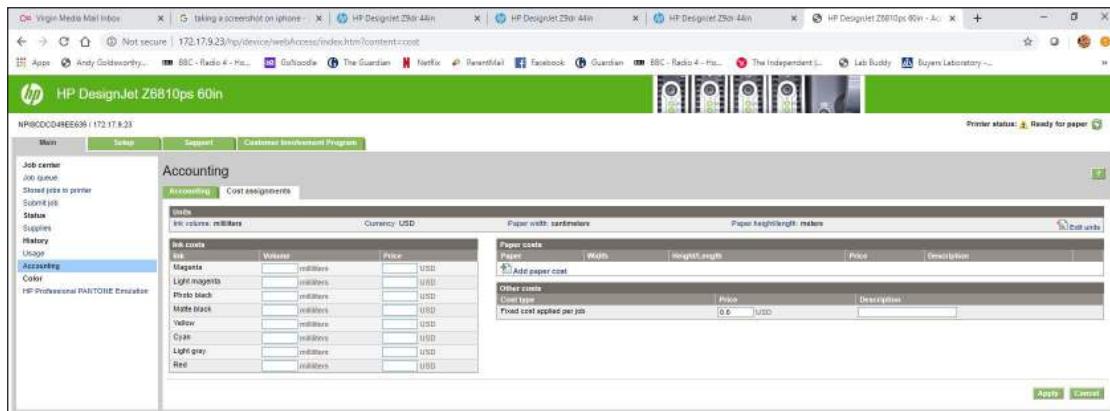
Canon's optional PosterArtist is a poster and signage creation tool offering advanced features such as auto design, variable data printing, in-application editing features, plus additional templates to create multi-language versions of a poster, photos, and clip art. (PosterArtist Lite, shown above, comes bundled only with the PRO-2100 and 4100 series).



HP users can create posters via a redesigned poster application in the HP Applications Center (which also includes creative tools such as Adobe Stock, Unsplash, Vecteezy, and Pattern Design) and print them via HP Click.

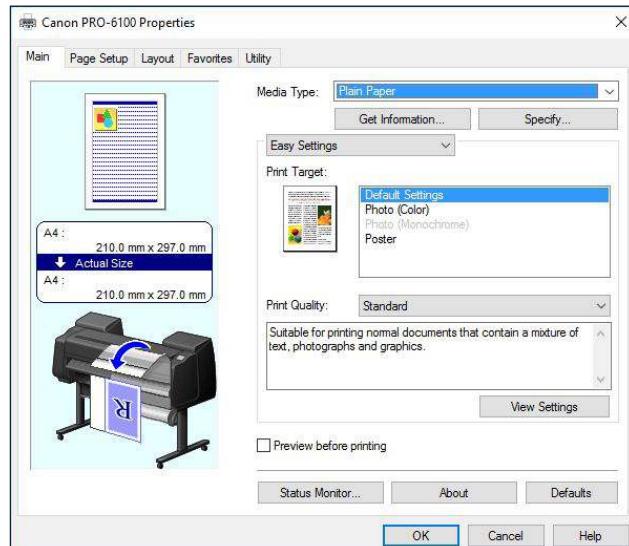
Job Properties		
Document Name : RGB_綾幅_色ズレ_文字品位_プリード_600dpi_40inch_v01.tif		
Printer :	PRO-6100S	
Printing Results :	Complete	
Order ID :	1633182	
Account ID :		
Total Job Cost :	***[]	
Total Paper Cost :	***[]	
Total Ink Cost :	0.820[]	
Total of Other Costs :	0.000[]	
Total Ink Consumed : 1.810[ml]		
Total Paper Consumed [Area] : 0.317[square meter]		
Paper Width :	106.680[cm]	
Paper Height :	29.690[cm]	
Total Sheets of Paper Consumed [Converted to A4 Size] : 6		
Job Cost and Consumption Details:		
Item	Amo...	Cost []
C(Cyan) Ink Consumed	0.105	0.048
GY(Grey) Ink Consumed	0.162	0.074
M(Magenta) Ink Consumed	0.203	0.092
MBK(Matte Black) Ink Consumed	0.028	0.013
PBK(Photo Black) Ink Consumed	0.687	0.310
PC(Photo Cyan) Ink Consumed	0.207	0.094
PM(Photo Magenta) Ink Consumed	0.246	0.111
Y(Yellow) Ink Consumed	0.172	0.078
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Available for the PRO series as a free download from Canon's website, Canon Accounting Manager offers comprehensive accounting management for print jobs. Users enter the actual costs for individual inks and media types, and the cost per job is calculated automatically and displayed. 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.

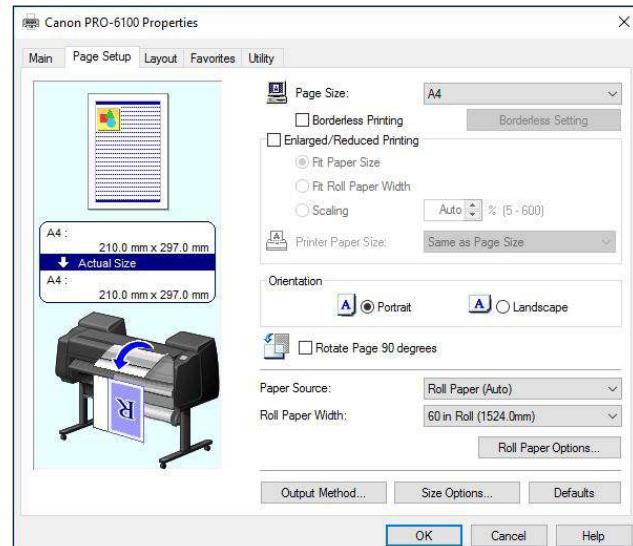


The HP Click utility offers a Job Accounting option which links to the Z6810 printer's web page Accounting section. Here, operators can assign costs against paper usage, job type, inks, or specify a fixed job cost, as well as export accounting reports in CSV format.

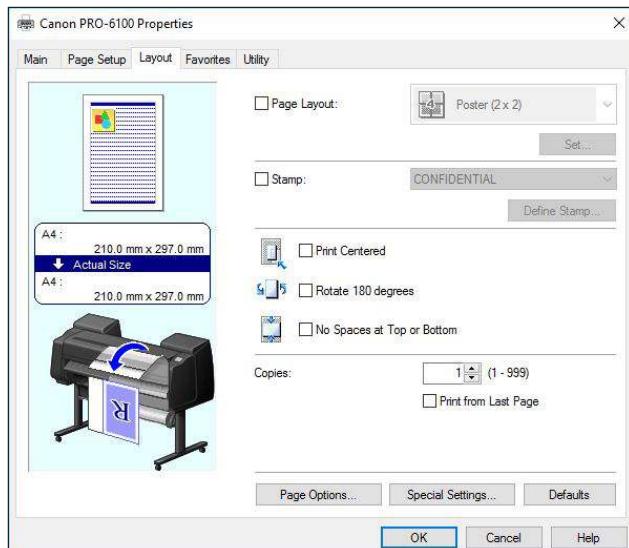
Test Models' Print Driver Screenshots



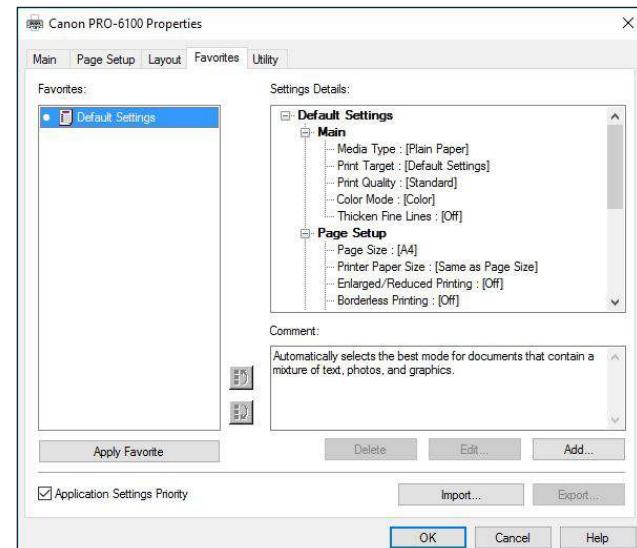
Canon PRO-6100S Main Tab



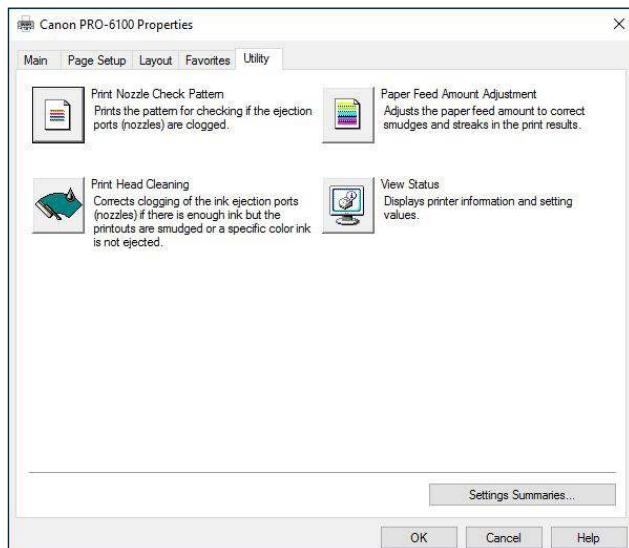
Canon PRO-6100S Page Setup Tab



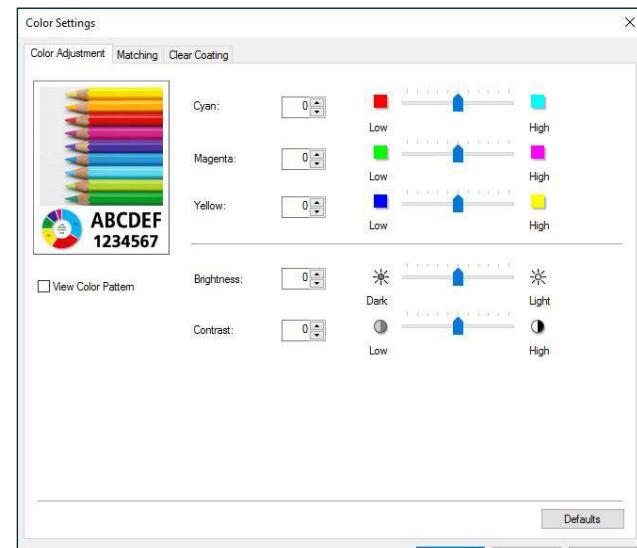
Canon PRO-6100S Layout Tab



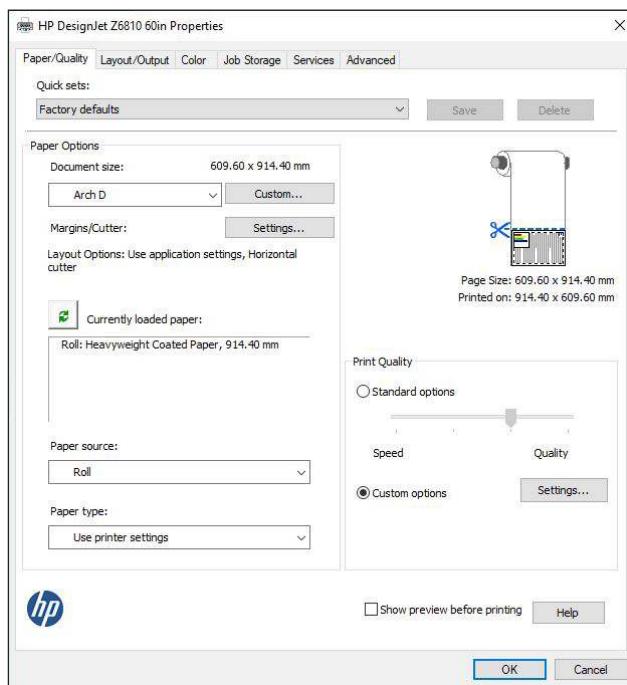
Canon PRO-6100S Favourites Tab



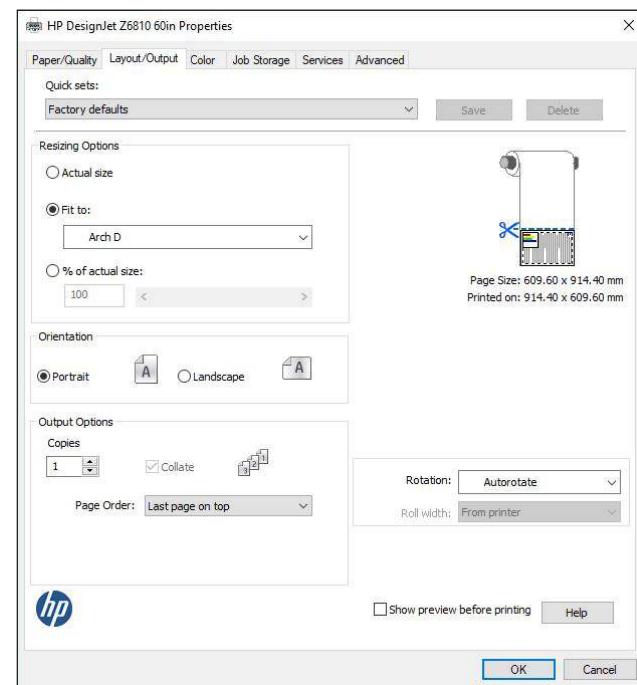
Canon PRO-6100S Utilities Tab



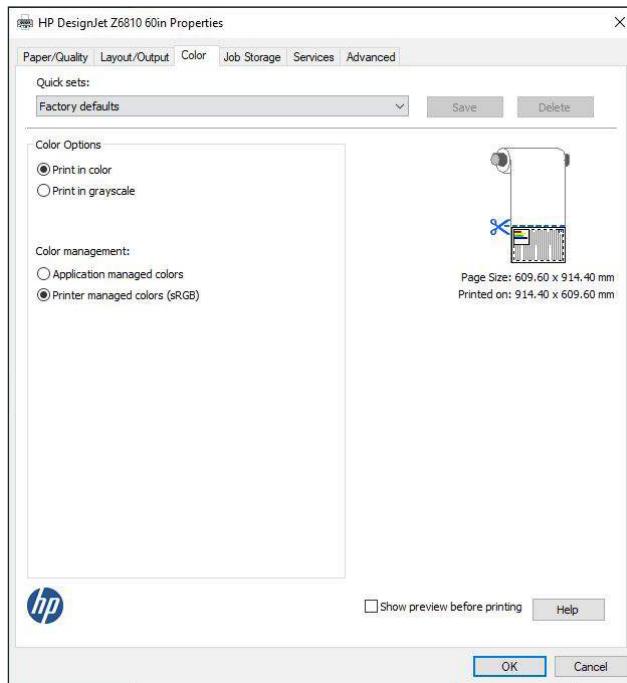
Canon PRO-6100S Colour Adjustment Settings



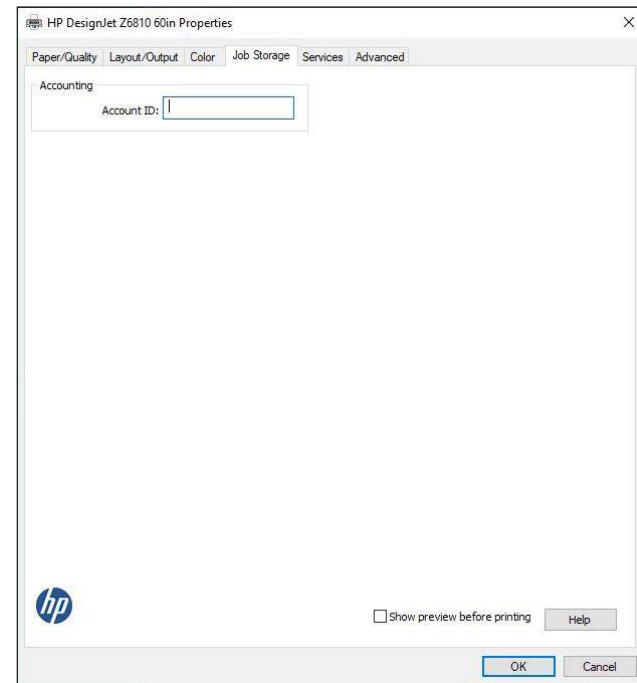
HP DesignJet Z6810 Paper/Quality Tab



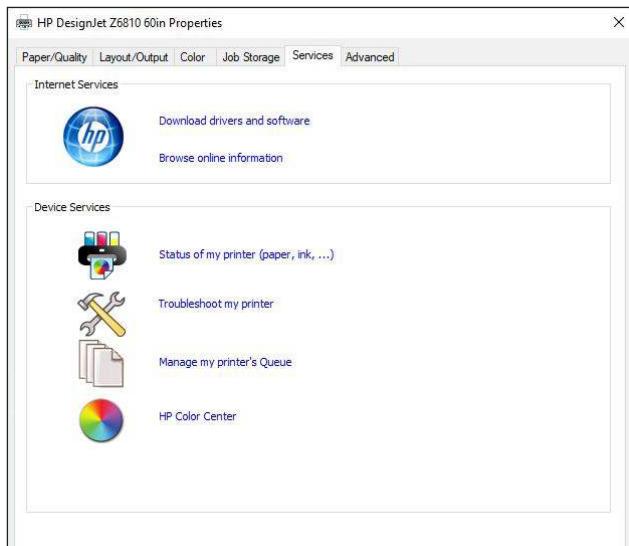
HP DesignJet Z6810 Layout/Output Tab



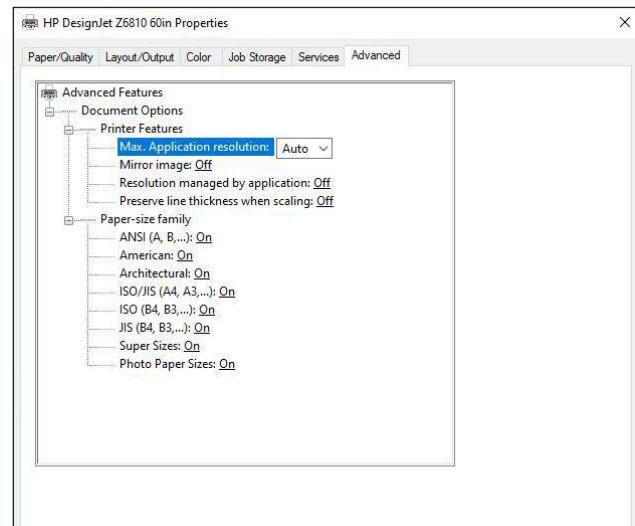
HP DesignJet Z6810 Colour Tab



HP DesignJet Z6810 Job Storage Tab



HP DesignJet Z6810 Services Tab



HP DesignJet Z6810 Advanced Tab

Printhead Reliability / Cleaning Routines

- The Canon PRO-6100S enables users to run a printhead nozzle check pattern at the control panel. The default setting is an Auto nozzle check, while additional settings include 'after one page', 'after 10 pages' or 'disable'. The HP DesignJet Z6810 offers only one option to run a nozzle check pattern – 'Print Diagnostic Image', which can be found in the main Settings menu under the Optimize Print Quality option.
- 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 HP model does not offer any indication that it conducts automatic printhead maintenance other than when the machine is initializing after being switched on. However, users can initiate a clean printhead maintenance process at the control panel for one or more printheads. The control panel indicates an estimate of time to clean the printheads—approximately five minutes to clean all printheads, and two minutes for a pair of printheads).
- + 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 the pattern perfectly after a performing a cleaning. In contrast, the nozzles of the HP unit became clogged over the weekend and required at least one cleaning cycle to resolve the issue, leading to operator downtime.
- + A standard cleaning cycle performed on the Canon model takes approximately four minutes, 26.45 seconds on average to complete, whilst on the HP unit, a cleaning cycle is a little longer at six minutes, 56.22 seconds.

SUPPORTING TEST DATA

Productivity

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

Canon imagePROGRAF PRO-6100S		HP DesignJet Z6810	
Fast	Standard	Fast	Normal
123.18	185.24	132.65	151.65

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. Both devices were loaded with 36" 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 PRO-6100S		HP DesignJet Z6810	
Fast	Standard	Fast	Normal
59.44	90.53	87.03	112.29

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 36" 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).

Colour Throughput Time – A0 High-Resolution Portrait Printing (in Seconds)

Canon imagePROGRAF PRO-6100S		HP DesignJet Z6810	
Fast	Standard	Fast	Normal
231.08	367.92	216.72	289.29

A single-page high-resolution A0 portrait was printed as a five-page job using the device driver set to the semi-gloss photo/colour setting. Both devices were loaded with 36" 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 – A0 Medium-Resolution Retail Poster Printing (in Seconds)

Canon imagePROGRAF PRO-6100S		HP DesignJet Z6810	
Fast	Standard	Fast	Normal
110.64	181.47	156.71	218.08

A single-page medium-resolution A0 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 36" 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 PRO-6100S		HP DesignJet Z6810	
		Fast	Standard	Fast	Normal
Time Before Printing Commences		22.56	22.53	19.57	19.29
First Print Out Time		129.84	187.81	108.23	141.21

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 HP drivers set to semi-gloss photo media. Both devices were loaded with 36" rolls.

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

		Canon imagePROGRAF PRO-6100S		HP DesignJet Z6810	
		Fast	Standard	Fast	Normal
Time Before Printing Commences		22.35	22.86	26.60	17.76
First Print Out Time		65.59	100.17	84.39	99.18

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 HP drivers set to matte coated media. Both devices were loaded with 36" rolls.

Colour Print Quality

Colour Optical Density Evaluation

Canon imagePROGRAF PRO-6100S						
Highest						
	1	2	3	4	Max.	Min.
Cyan	2.24	2.24	2.24	2.25	2.25	2.24
Magenta	1.91	1.90	1.91	1.91	1.91	1.90
Yellow	1.31	1.31	1.31	1.31	1.31	1.31
Black	1.80	1.80	1.80	1.80	1.80	1.80

HP DesignJet Z6810						
Best						
	1	2	3	4	Max.	Min.
Cyan	1.96	1.98	1.96	1.98	1.98	1.96
Magenta	1.74	1.74	1.74	1.74	1.74	1.74
Yellow	1.24	1.24	1.24	1.24	1.24	1.24
Black	1.83	1.86	1.83	1.86	1.86	1.83

Note: Colour density readings were assessed by printing a Buyers Lab test file on proofing paper in highest-quality colour settings and measuring the density of 100% dot fill using an X-Rite exact^{XP} densitometer.

Skin Tone and Neutral Grey Consistency

Skin Tone 1 (Formula: C=6, M=15, Y=16, K=0)		
	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Colour block		
2	0.3	0.1
3	0.3	0.3
4	0.4	0.1
5	0.3	0.1
6	0.2	0.2
7	0.3	0.1
8	0.4	0.3
9	0.6	0.4
Max. Delta E Variance	0.4	0.3

Skin Tone 2 (Formula: C=30, M=63, Y=75, K=0)		
	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Colour block		
2	0.2	0.1
3	0.3	0.2
4	0.1	0.2
5	0.3	0.1
6	0.4	0.2
7	0.4	0.2
8	0.3	0.2
9	0.6	0.2
Max. Delta E Variance	0.5	0.1

Skin Tone 3 (Formula: C=19, M=33, Y=50, K=0)		
	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Colour block		
2	0.5	0.3
3	0.6	0.2
4	0.3	0.2
5	0.5	0.1
6	0.5	0.2
7	0.4	0.2
8	0.4	0.1
9	0.5	0.1
Max. Delta E Variance	0.2	0.1

Neutral Grey		
	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Colour block		
2	0.1	0.1
3	0.2	0.1
4	0.3	0.1
5	0.2	0.2
6	0.3	0.2
7	0.3	0.3
8	0.2	0.1
9	0.2	0.2
Max. Delta E Variance	0.2	0.2

Note: Skin tone and neutral grey consistency measurements are based on nine readings taken from a Buyers Lab proprietary PDF test target file comprising four A1-sized solid coverage documents of three skin tones and a neutral grey with the Highest/Best quality setting selected in the driver and the target printed on the manufacturer's own brand of proofing semi-gloss media. 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.

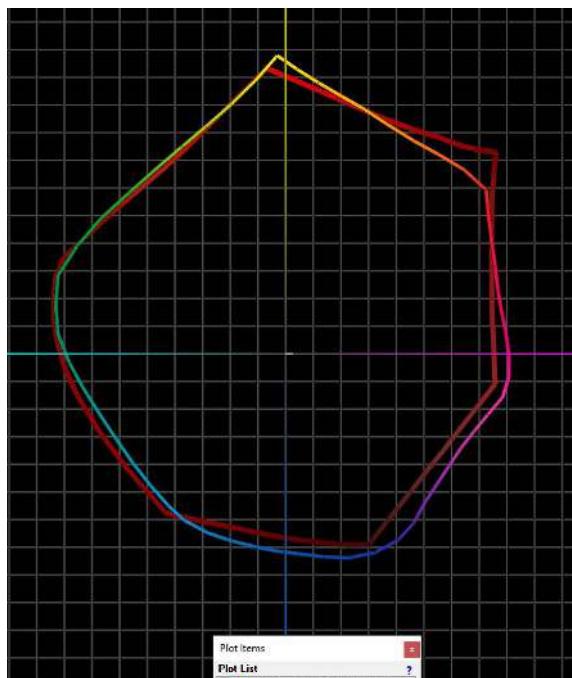
FOGRA 39 Drift Test

Comparison of FOGRA39 colour patches before and after ink consumption test

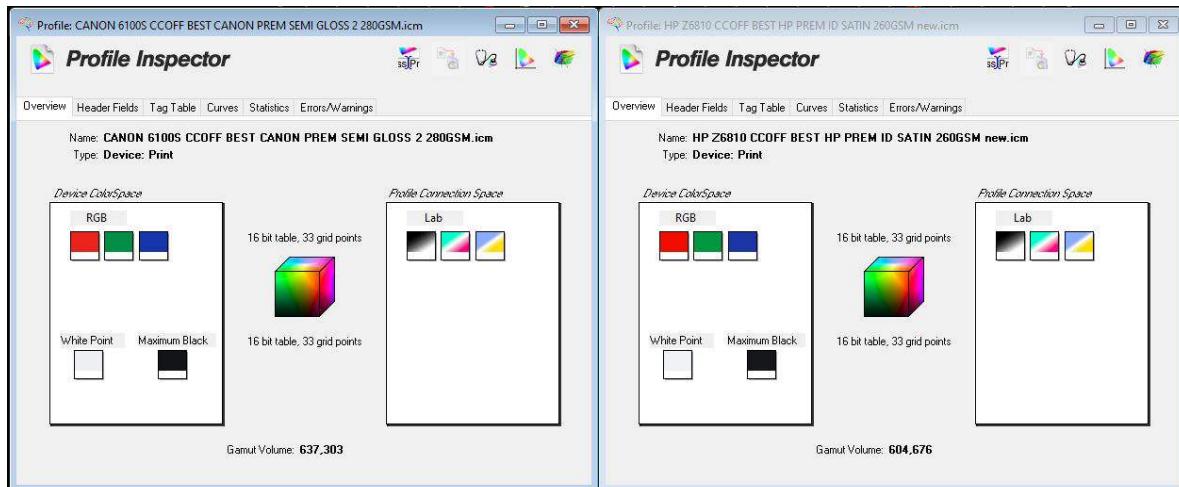
	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810
Delta E Drift	1.7	1.3

Colour Gamut Comparison

Media Type/Settings	Canon imagePROGRAF PRO-6100S	HP DesignJet Z6810	Canon % larger/smaller (-) than HP
Photo Paper Highest/Best	637,303	604,676	5.4



Canon imagePROGRAF PRO-6100S colour gamut (shown chromatically) on Premium Semi-Gloss photo paper in Highest mode with colour correction disabled versus HP Designjet Z6810 colour gamut (red) on Instant-Dry Satin photo paper in Best quality mode with colour adjustment disabled.



Colour gamut profile for Canon imagePROGRAF PRO-6100S (left) and HP DesignJet Z6810 (right) on photo paper in highest-quality mode.

Device Feature Set

Canon imagePROGRAF PRO-6100S		Advantage	HP DesignJet Z6810	
Max. print resolution	2400 x 1200 dpi			2400 x 1200 dpi
Number of inks	Eight (GY, PM, M, MBK, PBK, PC, Y, C)			Eight (C, M, Y, MBK, PBK, CR, LG, LM)
Ink tanks replaceable during operation	Yes	✓		No
Ink-drop size	Minimum 4 picoliter	✓		4 pl (LC, LG, LM, PBK); 6 pl (C, M, MK, Y)
Starter cartridge ink capacity	2,640 ml (330 ml bundled starter ink)			INA

Ink cartridge capacity	160 ml, 330 ml, and 700 ml (all colours)		✓	775 ml (all colours)
Number of nozzles	1,536 per colour			INA
Number of printheads	1			8
Printhead replacement	User replaceable			User replaceable
Line accuracy	+/-0.1% or less			+/-0.1% or less
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)			5 mm (all sides)
Borderless (0 mm) printing	Yes all sizes and media supported	✓		No
Maximum outside diameter of roll paper	170 mm			170 mm
Maximum printable paper roll length	18 m (varies according to the OS, RIP, and application used)			INA
Maximum printable cut-sheet media length	1.6 m			NA
Maximum media thickness	Roll/cut: 0.07-0.8 mm	✓		0.6 mm
Maximum media width	60 inches			60 inches
Media loading	Front			Front
Roll paper	Standard Multifunction Roll System (dual roll and/or bi-directional auto Take up configuration)	✓		Single roll with built in take up reel
Optional media handling	Roll holder set (supports 2" and 3" media cores)			Spindle adapter (supports 3" media core)
Standard RAM	3 GB	✓		64 GB with 1 GB physical memory
Maximum RAM	3 GB	✓		64 GB with 1 GB physical memory
Hard drive	Standard 500-GB			Standard 500-GB
Interface	10/100Base-TX/1000Base-T/TX, USB 2.0 Hi-Speed, Wireless LAN: 802.2.11 b/g/n	✓		Gigabit Ethernet (1000Base-T); optional Jetdirect print server
PDL	SG Raster			HP-GL/2, HP-RTL, CALS G4; optional Adobe PostScript 3, Adobe PDF 1.7, TIFF, JPEG
Net weight (unpacked) and size	141 kg / 1,999 mm	✓		195 kg / 2,450 mm
Power consumption when in standby	3.6 W or less	✓		< 48 W
Power consumption when active	103 W or less	✓		270 W
Acoustic pressure	INA			Operation: 53 dB (A); Standby: 39 dB (A)
Acoustic power	INA			Operation: 7.0 Bels; Standby: 5.5 Bels
Option to integrate with a spectrophotometer?	No		✓	Standard embedded X-Rite i1 In-line spectrophotometer

INA – Information not available

Device Feature Set

		Canon imagePROGRAF PRO-6100S	Advantage	HP DesignJet Z6810
Speed settings	High, Standard, and Highest (depending on media settings)			Fast, Normal, and Best
Economy mode	No	✓	Yes (EconoMode option with Fast setting)	
Predefined profiles	4 (Under Easy Settings: Default, Photo Color, Photo Monochrome, and Poster)	✓	7 (Default, CAD, GIS, Photo, Black and White Photo, Poster, and Canvas)	
Overview of profile settings provided	Yes			Yes
Media profiles	66 + 10 user customizable special options	✓		62
IQ optimized for various types of output	Yes			Yes
Watermark	Yes	✓		No
Sharpen text	No	✓	Yes (called Max Detail)	
Thicken fine lines	Yes			Yes (called Max Detail)
Mirror image	Yes			Yes
Multi-up printing	Yes, 2 to 16	✓		No
Poster print mode	Yes (2 by 2)	✓		No
Page stamping	Yes (Under Layout and Page Options: Date, Time, User Name, Page Number)	✓		No
Image rotation	Yes, 90 degrees and 180 degrees	✓	Yes, auto, 90, 180, and 270 degrees	
Option to preview before print	Yes			Yes
Link to device web server from driver	Yes (via link to Status Monitor)	✓	No (link to HP DesignJet Utility to view consumables and perform calibration)	
CMYK balance adjustment	Yes (CMY only)	✓		No
Brightness adjustment	Yes	✓		No
Contrast adjustment	Yes	✓		No
Saturation adjustment	No			No
Advanced colour management options	Yes			Yes
Enlargement Copy Mode	Yes			INA
Free Layout Capability	Yes (flexible placement)	✓	Yes (automatic nesting via HP Click)	
MS Office Plug-in	Yes	✓		No
Adobe Photoshop Plug-in	Yes*			INA
Accounting Capability	Yes (Canon Accounting Manager)			Yes (HP Click)
Disable automatic cutter	Yes			Yes
Unidirectional printing selection option	Yes			Yes
Integration with MFP	Yes			INA

* The Canon PRO-6100S supports Canon's latest 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.

Ink Consumption

Table 1: Approximate Amount of Ink in each Canon imagePROGRAF PRO-6100S 700-ml Cartridge (in Grams)

	GY	PM	M	MBK	PBK	PC	Y	C
Weight of cartridge prior to installation	947.3	947.3	947.3	947.3	947.3	947.3	947.3	947.3
Weight of cartridge at end of life	200.9	200.9	200.9	200.9	200.9	200.9	200.9	200.9
Net weight of ink	746.4	746.4	746.4	746.4	746.4	746.4	746.4	746.4
Total ink weight across eight cartridges								5,971.2

Table 2: Approximate Amount of Ink in each HP DesignJet Z6810 775-ml Cartridge (in Grams)

	M	LM	PBK	MBK	Y	C	LG	R
Weight of cartridge prior to installation	986.8	986.8	986.8	986.8	986.8	986.8	986.8	986.8
Weight of cartridge at end of life	174.8	174.8	174.8	174.8	174.8	174.8	174.8	174.8
Net weight of ink	812.0	812.0	812.0	812.0	812.0	812.0	812.0	812.0
Total ink weight across eight cartridges								6,496

Table 3: Ink Used in Three 50-Page Runs of Packaging Proof Test Document (Standard Mode) on the Canon PRO-6100S (in Grams)

	GY	PM	M	MBK	PBK	PC	Y	C
Test Run 1 Net weight of ink used	26.7	17.8	14.1	8.8	31.0	10.7	13.5	8.5
Test Run 2 Net weight of ink used	26.6	17.3	12.8	8.6	31.5	13.6	13.2	8.4
Test Run 3 Net weight of ink used	26.2	17.1	12.6	8.1	30.5	11.4	12.8	8.8
Average amount of ink used across three runs	26.5	17.4	13.2	8.5	31.0	11.9	13.2	8.6
Total ink weight across eight cartridges for 50-page run (based on averages)								130.3

Table 4: Ink Used in Three 50-Page Runs of Packaging Proof Test Document (Normal Mode) on the HP DesignJet Z6810 (in Grams)

	M	LM	PBK	MBK	Y	C	LG	R
Test Run 1 Net weight of ink used	16.6	7.3	26.1	25.5	20.4	13.4	10.1	12.5
Test Run 2 Net weight of ink used	17.0	7.6	26.4	26.3	20.7	13.6	10.3	12.8
Test Run 3 Net weight of ink used	17.2	8.1	23.9	25.3	20.1	14.2	10.0	12.3
Average amount of ink used across three runs	16.9	7.7	25.5	25.7	20.4	13.7	10.1	12.5
Total ink weight across eight cartridges for 50-page run (based on averages)								132.5

Table 5: Ink Used in Three 50-Page Runs of Retail Sales Poster Test Document (Standard Mode) on the Canon PRO-6100S (in Grams)

Table 6: Ink Used in Three 50-Page Runs of Retail Sales Poster Test Document (Normal Mode) on the HP DesignJet Z6810 (in Grams)

Table 7: Ink Used in Three 50-Page Runs of Studio Portrait Test Document (Standard Mode) on the Canon PRO-6100S (in Grams)

Table 8: Ink Used in Three 50-Page Runs of Studio Portrait Test Document (Normal Mode) on the HP DesignJet Z6810 (in Grams)

Ink Consumption Test Methodology Overview

Buyers Lab'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 PRO-6100S was installed in Buyers Lab's lab with the latest 01.05 level of firmware (as of November 2019) and connected to a Windows 10 workstation using a 1000BaseT TCP/IP connection. The device was left in default configuration throughout testing. The Canon imageRUNNER Printer Driver was used for all testing and was left in default colour setting configuration. The Packaging Proof document was printed on 195gsm medium weight proofing media in Standard mode. The Retail Poster was printed on 140gsm matte coated media in Standard mode, and the Studio Portrait photo was printed on 280gsm semi-gloss photo media in Standard mode.

The HP DesignJet Z6810 was installed in Buyers Lab's lab with the latest "PX8_05_01_00.4" level of firmware (as of November 2018) and connected to a Windows 10 workstation using a 1000BaseT TCP/IP connection. The device was left in default configuration throughout testing. The PCL driver was used for all testing and was left in default colour setting. The Packaging Proof document was printed on proofing matte paper media in Normal mode. The Retail Poster was printed on heavyweight coated paper media in Normal mode, and the Studio Portrait photo was printed on HP premium instant-dry photo gloss media in Normal Mode.

Before installing the ink cartridges, Buyers 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 and used as the empty weight for each colour.

Test Environment

Products were tested in Buyers Lab's environmentally controlled UK test lab, which replicates typical office conditions.

Test Equipment

Buyers Lab'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 Buyers Lab in its lab testing include Buyers Lab's proprietary procedures and industry-standard test procedures. In addition to a number of proprietary test documents, Buyers Lab uses industry standard files including a Buyers Lab 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 an Xrite exact^{XP} densitometer.

About Keypoint Intelligence - Buyers Lab

Keypoint Intelligence is a one-stop shop for the digital imaging industry. With our unparalleled services and unmatched depth of knowledge, we cut through the noise of data to offer clients the independent insights and responsive tools they need.

For over 50 years, Buyers Lab has been the global document imaging industry's resource for unbiased and reliable research, test data, and competitive information services. In addition to publishing the industry's most comprehensive and accurate test reports, each representing months of hands-on testing in our U.S. and UK laboratories, we have been the leading organization for extensive specifications/pricing databases on MFPs, printers, scanners, and software. Buyers Lab also provides consulting services and a range of private testing services that include document imaging device beta and pre-launch testing, performance certification testing, consumables testing (toner, ink, fusers, and photoconductors), solutions evaluations, and media runnability testing.

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