

KPI Comparative Lab Test Report

FEBRUARY 2018

Canon imagePROGRAF TX-3000

vs. HP DesignJet T1530

Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Colour Image Quality	✓	
Black Image Quality	✓	
Colour Print Productivity	✓	
Black Print Productivity	✓	
Banner Printing	✓	
Poster Printing	✓	
Direct Print Submission Functionality		✓
Ink Consumption	✓	
Device Feature Set	✓	
Print Driver Feature Set	✓	

TEST OBJECTIVE

Keypoint Intelligence – Buyers Lab was commissioned by Canon Europe to conduct confidential document imaging device performance testing on the Canon imagePROGRAF TX-3000 and the HP DesignJet T1530, and produce a report comparing the relative strengths and weaknesses of the two products in the areas of image quality, productivity, banner and poster printing, direct print submission functionality, device feature set, driver functionality and ink consumption. All testing was performed in Buyers Lab’s European test facility in Wokingham, UK.

Executive Summary

Canon's latest large-format imagePROGRAF TX Series is designed to meet the needs of customers who require higher productivity for their technical documents, but still demand exceptional quality as befitting the Architectural, Engineering and Construction (AEC) and Geographical Information Systems (GIS) markets. The imagePROGRAF TX-3000 in these respects did not disappoint. It gave a sterling performance and outperformed the HP DesignJet T1530 in the majority of test categories in Buyers Lab's evaluation. Specifically, the TX-3000 delivered superior productivity, better colour and black image quality, richer device and driver feature sets and lower ink consumption for all three tests.

Whether printing after a weekend of non-use or from a ready state, the Canon TX-3000 demonstrated it was twice as fast as the HP T1530; the Canon model also excelled when printing Buyers Lab's job stream, designed to simulate a typical mixed workflow for a large-format unit. Buyers Lab technicians observed that the speed advantage of the Canon model over the HP unit became more pronounced as the quality level was increased, which enables Canon users to achieve optimum image quality without sacrificing productivity. Both models offer a dual-roll design—a productivity-boost for environments where users need to print regularly on different media types or sizes—and while the time to switch between rolls was comparable for both models, the Canon TX-3000 was the faster model in Buyers Lab's dual-roll job stream evaluation. One significant productivity-boosting advantage for the Canon model is its hot-swap ink tank design, which lets users replace empty inks while the device is still actively printing. In contrast, when the HP T1530 runs out of ink, printing has to stop for a cartridge to be replaced, which leads to some operator downtime.

Both models delivered high-quality results when printing technical documents and graphics—results that would easily satisfy any AEC, CAD (Computer-Aided Design) or GIS customer requirements. Yet, the Canon model had superior colour and black image quality in the majority of areas. Despite the HP T1530 producing higher colour and black optical densities overall and a larger colour gamut in Fast mode when printing on plain paper, the TX-3000 delivered crisper text and fine lines (which exhibited no bleed unlike those from the HP unit); more distinct detailing in business graphics; more vibrant, saturated colours in photographic output; and more natural-looking skin tones. Both models produced superb fine detailing in light contrast areas on photographic output. Poster output produced by both models exhibited some banding in Fast mode (in the darker areas with the Canon output but across the whole image with the HP model). However, the Canon TX-3000's unidirectional printing feature gives it a key advantage in being able to eliminate banding, even in Fast mode.

In terms of device and driver feature sets, the Canon TX-3000 has plenty to offer over its rival HP model. In addition to the aforementioned hot-swap ink tanks, it has higher cartridge capacities, a higher capacity stacker, higher standard non-upgradeable memory capacity to aid with job processing, smaller ink drop sizes, more media profiles, and a flexible layout nesting option to save on paper. (The HP model offers a similar feature but the user doesn't have the same flexibility and control over image placement). Canon users can integrate the TX-3000 device with a smaller-format MFP to produce enlarged, poster-size copies via the free Color imageRUNNER Enlargement Copy Mode utility, which is not available with the HP T1530. The TX-3000 offers robust security features as well, which include hard drive encryption and overwrite as standard, while the HP T1530 offers Secure Disk Erase as an option.

The HP DesignJet T1530 has numerous advantages of its own; Buyers Lab analysts were impressed with the design and build quality of the HP T1530's rear-mounted 50-sheet capacity stacker assembly, which is integrated with the main unit, giving it a more compact office footprint (which could be a critical factor where space is constrained). It holds printed sheets in perfect alignment, while a paper sensor detects when the stacker is full and halts operation, which prevents paper spillage or jamming issues. Whilst the Canon model's stacker is capable of holding twice as many (up to 100) printed sheets this only applies for CAD drawing prints, and it has no equivalent automatic sensor, which means that operators may have to be more vigilant in order to prevent jams or paper spillage when the stacker capacity is reached or exceeded. Buyers Lab technicians observed the flexible range of direct print and mobile print features available with the HP T1530 gave it an overall edge versus the TX-3000. For example, HP's Mobile Printing service offers additional functionality not available with

the Canon unit. It supports easy printing from Apple or Android mobile devices via a wireless network connection or Wi-Fi Direct, while users can also submit PDF, TIFF and JPEG files remotely via email to the T1530 for printing.

Overall, based on its superior image quality, faster productivity across the board, stronger feature sets and more efficient ink consumption, Buyers Lab judges the Canon imagePROGRAF TX-3000 as the stronger performer in its large-format production evaluation.

Colour Image Quality

Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Text	✓	
Fine Lines	✓	
Halftone Range	=	=
Halftone Fill	✓	
Solid Density		✓
AEC Graphics	=	=
GIS Graphics	=	=
Business Graphics	✓	
Photographic Images	✓	
Colour Gamut (Plain Paper, Fast)		✓
Colour Gamut (Plain Paper, Standard/Normal)	✓	
Colour Gamut (Plain Paper, High/Best Quality)	✓	
Colour Gamut (Matte Coated Paper, High/Best Quality)	✓	

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

O All image quality testing was conducted on CAD 90gsm inkjet plain paper.

- In terms of colour optical density, the Canon TX-3000 delivered superior optical densities on plain paper in all modes for cyan, and had comparable densities for magenta and yellow in Standard/Normal mode. However, the HP T1530 produced the higher optical densities for composite black in all modes, and for magenta and yellow in Fast and Best modes.
- In the colour gamut assessment conducted on plain paper in Fast mode, the Canon TX-3000 delivered a 10.9% smaller colour gamut with a CIE volume of 140,164 versus a CIE volume of 157,245 for the HP model.
- + The Canon model produced a 30.3% larger colour gamut when printing on plain paper using Standard/Normal settings—with a CIE volume of 208,945 versus a CIE volume of 160,331 for the HP device.
- + When printing on plain paper in High/Best Quality settings, the Canon TX-3000 delivered a 24.7% larger colour gamut than the HP T1530, with a CIE volume of 229,826 versus a CIE volume of 184,281 for the HP model.

- + When printing on matte coated paper using Canon's High quality setting and the HP T1530's Best quality setting, the Canon model delivered a far larger (43.9%) colour gamut than that of the HP unit, with an impressive CIE volume of 402,815 compared with 279,864 for the HP T1530.
- + The Canon TX-3000 delivered superior colour text reproduction overall; it produced dark, pin-sharp Arial sans serif text that was legible down to the smallest (3-pt.) type size, with no breakup or bleed, in all tested modes. Serif characters, again, displayed no bleed and were legible down to 3-pt. size in Fast mode and 5-pt. size in Standard and High modes. In contrast, the HP T1530 produced sans serif text that was legible down to the 3-pt size level in Fast and Best modes, but characters were less distinct as they exhibited ink bleed, while Times New Roman text was legible at the 4-pt size in Standard/Normal mode also with some bleed.
- + Fine lines produced by both devices remained distinct at the 0.1-pt. level across all modes. However, there were some noticeable differences in quality, with fine lines from the Canon TX-3000 being consistently very good and distinct, while there was some bleed evident in output produced by the HP model in Fast mode. In Standard/Normal mode, the HP model's fine lines were rated only fair.
- + In Fast and Standard/Normal modes, the Canon model produced 0.1-pt. circles that were smooth and unbroken, and rated very good. In High/Best mode, the Canon model delivered 0.25-pt. circles that were, again, rated as very good. Circles produced by the HP T1530 model were fully formed at 0.1-pt but were only rated good in all tested modes as they were less smooth, and in Fast mode, circles suffered from some blurring.
- + The Canon TX-3000 produced the 1x1 pixel grid in CMY with no quality issues, and coverage was consistently very good across all colours. In contrast, the HP model only delivered good coverage on the CMY 2x2 pixel grid in Fast mode; in Normal and Best modes, the HP model delivered the 1x1 pixel grid in CMY with good coverage, but dots were slightly less distinct in Normal mode.
- Both devices delivered colour halftone output across the full range—from the 10% to 100% dot-fill levels—in all modes with distinct transitions between all levels.
- + The Canon TX-3000 delivered very good, smooth colour halftone fills in all modes, while the HP model delivered smooth halftone coverage that was rated as good in Fast mode and very good in Normal and Best modes.
- When evaluating Architectural, Engineering and Construction (AEC) graphics in Standard/Normal mode, the output from both devices exhibited an excellent level of detail, very distinct fine lines and clear text formation.
- When evaluating Geographic Information Systems (GIS) graphics in Standard/Normal mode on plain paper, both units delivered very good detail and showed an equally good depth of field—a critical factor in delivering a realistic three-dimensional rendering of topographical features.
- + Colour business graphics produced by the Canon TX-3000 exhibited slightly smoother transitions from light to dark areas and sharper fine details than did those produced by the HP device.
- + When comparing photographic images in Fast mode, the Canon TX-3000 delivered excellent detailing and colours that were more true to the original test target, when compared with images produced by the HP unit, which suffered from a magenta bias. In Standard/Normal mode, both models delivered excellent detailing in dark and light contrast areas with good saturation, but colours were consistently brighter in output from the Canon model. In High/Best mode, the Canon unit delivered brighter colours and slightly better detailing in dark contrast areas, and both models delivered excellent detailing in light contrast areas.
- + Skin tones produced by the Canon TX-3000 model were natural-looking, while those produced by the HP model were pale in Fast mode and slightly yellowish in Normal and Best modes.
- + Overall, Buyers Lab technicians judged the Canon TX-3000 as the superior performer in the colour image quality evaluation. This model delivered superb crisp text and fine lines; smoother circles; brighter, more saturated colours and natural-looking skin tones as well as larger colour gamut sizes in the majority of tests, especially on matte coated paper. The HP T1530 model delivered the higher colour densities for all colours except cyan, and a larger colour gamut in Fast mode. Importantly, as befitting the needs of their target market, both models produced distinct fine lines in AEC drawings and an excellent level of detail in GIS graphics, with very good depth of field even on plain paper.

Black Image Quality

Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Text	✓	
Fine Lines	✓	
Halftone Range	=	=
Halftone Fill	✓	
Solid density		✓
AEC Graphics	=	=
Business Graphics	✓	
Photographic Images	=	=

- When printing in monochrome, the HP model delivered darker solids with higher optical densities in all tested modes.
- + Black serif text produced by the Canon TX-3000 unit displayed clear character definition and was legible down to the 5-pt. size in Fast and Standard modes and 3-pt. size in High quality mode, with no breakup and bleed. Sans serif characters were crisp, dark and legible down to the 3-pt. level for all modes. Although, serif and sans serif fonts produced by the HP T1530 were legible down to the 3-pt. size level for all modes, character definition was less distinct and suffered from some ink bleed at all modes tested.
- + In Buyers Lab's line art reproduction test, both models' fine lines remained distinct at the 0.1-pt. level in all modes. However, the Canon TX-3000 delivered the better quality overall, with crisp and distinct fine lines in Standard/Normal mode, which were rated very good, but judged only fair for the HP model. In Fast mode, both models' fine lines were rated good. Moreover, white-on-black fine lines produced by both models remained distinct at the 0.25-pt. level in all quality modes and were rated as very good for the Canon TX-3000 in all quality modes, but only fair for the HP T1530, except in Fast mode where its white-on-black lines were rated poor.
- + Circles produced by both models were fully formed at 0.1pt, but the Canon TX-3000 delivered far smoother circles than those produced by the HP unit; while the HP model's circles were rated good across the board, the Canon model's circles were rated very good in Fast and Standard modes and excellent in High quality mode.
- O Both models produced the 1x1 pixel grid in black with no quality issues; coverage was good (in Fast and Standard/Normal modes) and very good in High/Best mode.
- O Both models delivered black halftone output across the full range—from the 10% to the 100% dot-fill levels—with distinct transitions between all levels.
- + Halftone fill results in all modes were rated as good for the HP device. Although greyscale coverage was slightly grainy at the 80% to 100% fills in Fast mode for the Canon model, coverage was smooth in Standard and High modes and rated very good.
- O When evaluating AEC graphics in Standard/Normal mode in black, both models delivered distinct fine lines.
- + Monochrome business graphics were produced more accurately by the Canon model, given that some fine lines and circles were slightly less distinct in the output produced by the HP unit, but only when viewed under magnification.
- O Greyscale photographic images produced in Fast and High/Best modes on plain paper by the Canon TX-3000 displayed very good depth and fine detailing in light and dark contrast areas, as did the images produced by the HP model. In Standard/Normal mode, the Canon model's images were rated as very good and displayed superb fine detailing in light contrast areas, while output from the HP model showed very good detailing in dark

contrast areas. In Fast and Standard/Normal modes, there was slight graininess in dark areas on output from the Canon model, while some banding was visible on output from the HP unit.

- + Although results were more mixed in Buyers Lab’s monochrome image quality assessment, the Canon TX-3000 produced better quality overall, delivering superior text and fine lines (with no ink bleed), sharper business graphics and smoother greyscale coverage, while the HP T1530 produced higher black optical densities across the board. In addition, both units delivered distinct fine lines in AEC graphics, a full halftone range and very good fine detailing in photographic images.

Print Productivity

Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
First Page Out from Weekend Non-Use	✓	
First Page Out from Ready State	✓	
Throughput Speed (Fastest mode)	✓	
Throughput Speed (Default mode)	✓	
Throughput Speed (Highest-quality mode)	✓	
Job Stream	✓	
Dual-Roll Job Stream	✓	

- + The Canon TX-3000 was twice as fast as the HP model in the first-page-out after a weekend of non-use evaluation, with a time of 86.28 seconds compared with 172.01 seconds for the HP device. Start-up time before printing commenced was, again, much faster for the Canon model at 62.25 seconds, compared with 101.19 seconds for the HP unit.
- + The Canon device delivered a 47.5% faster first-page-out time of 45.53 seconds from its ready state, compared with 86.72 seconds for the HP T1530. Start-up time before printing commenced was slower for the Canon model—22.53 seconds compared with 15.83 seconds for the HP model—but combined with the first-page-out from ready result, it is clearly the faster model, overall.
- + When printing Buyers Lab’s job stream, designed to simulate a typical mixed workflow for a large-format unit, the Canon TX-3000 was 8.7% faster than the HP model in Fast mode, 33.4% faster in Standard/Normal mode, and 53.4% faster in High/Best mode.
- + As both models offer a dual-roll design, Buyers Lab conducted a second job stream test, sending the same files as alternate jobs to different rolls to test both models’ efficiency when switching between rolls. The Canon TX-3000 completed the dual-roll job stream in Fast mode in 789.94 seconds—which is 6.8% faster than that of the HP T1530 model (848.00 seconds).
- Buyers Lab analysts observed that the actual time taken to switch between rolls (around 22 seconds) was comparable for both models.
- + When printing Buyers Lab’s 12-page DWF test file in colour, the Canon TX-3000 was faster than the HP unit in all modes tested; it was 8.4% faster in Fast mode; 33.3% faster in Standard/Normal mode; and 53.6% faster in High/Best mode.

- + Similarly, when printing Buyers Lab’s 12-page DWF test file in monochrome, the Canon model was the faster model across the board; it was 7.4% faster in Fast mode; 33.2% faster in Standard/Normal mode and 53.2% faster in High/Best mode than the HP unit.
- + When printing Buyers Lab’s single-page A0-size test target in Standard/Normal mode, the Canon TX-3000 delivered a first-page-out time (114.10 seconds) that was 24.0% faster than that of the HP unit (150.17 seconds). The time to print five A0-size pages was 30.6% faster for the Canon TX-3000 than for the HP device (497.09 seconds versus 716.64 seconds).
- + The Canon model’s unique sub ink tank system provides a further boost to productivity. When the HP T1530 model runs out of ink, printing must stop for the cartridge to be replaced, which leads to operator downtime. In contrast, when ink needs replacing on the Canon model it will continue to print, drawing ink from its sub tank, while ink is replaced, so there’s no operator downtime. For added convenience, the control panel alerts users to replace ink and also provides purchasing information.
- Both the Canon and HP models will pause and alert the operator when they run out of paper. After a new roll is installed, each device resumes printing at the beginning of the interrupted page, rather than printing the portion of the page that remained before running out of paper, so less ink and paper is wasted.

Banner Printing

Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Image Quality	=	=
Productivity	✓	

- + Both models successfully printed Buyers Lab’s 36” x 105” banner (a 4,955-KB PDF file) in Fast mode. The HP DesignJet T1530 took longer to print than did the Canon TX-3000. The HP unit took 5 minutes, 25.96 seconds from PC release to final paper cut, and provided no preview. In contrast, the Canon model took 7.68 seconds to generate a preview at the desktop, and an additional 1 minute, 54.53 seconds from preview to final paper cut. With a total preview and print time of 2 minutes, 2.21 seconds, the Canon TX-3000 is clearly the faster model.

Poster Printing

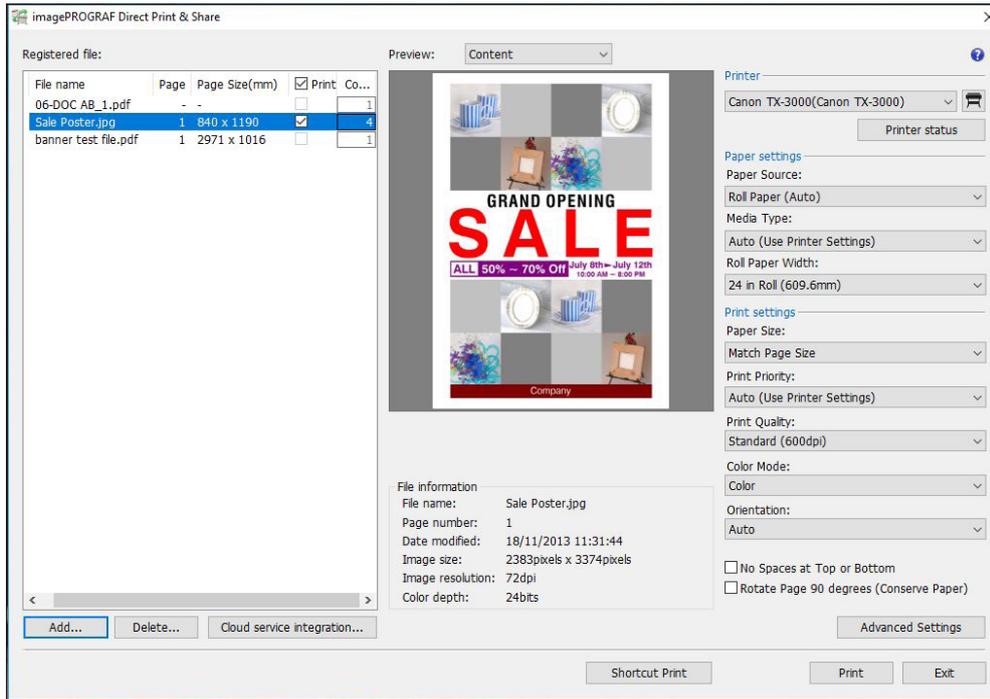
Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Image Quality	✓	
Productivity (Fast mode)	✓	
Productivity (Standard/Normal mode)	=	=
Productivity (High/Best Quality mode)	✓	

- + When printing Buyers Lab’s Poster test target in Fast mode at 300 dpi, the Canon TX-3000 took 33.33 seconds to complete the job, while the HP T1530 took 36.77 seconds.
- + In terms of image quality, there was some banding evident on output printed in Fast mode by both models (across the whole image with the HP unit, but only in dark areas with the Canon model). Colours on the HP poster were slightly pale compared with the much brighter colours in the poster produced by the Canon model. When unidirectional printing was selected in the Canon print driver, banding was eliminated but the time to print the banner increased to 52.80 seconds.
- O The Canon model took 1 minute, 18.38 seconds to print the poster in Standard mode at 600 dpi, a time matched by the HP unit in Normal mode.
- + In Standard/Normal mode, the Canon poster showed no banding and colours were vibrant with good detailing; the HP unit’s poster still exhibited some banding in both light and dark areas, but colours were much brighter (compared with Fast mode) but again, BLI technicians’ noted they weren’t as bright as those produced by the Canon model.
- + When printing the poster in High quality (600 dpi), the Canon model took 2 minutes, 6.00 seconds, which is 27.8% faster than the HP unit’s 2 minutes, 54.53 seconds result when printing in Best mode.
- + At the High/Best Quality settings there was no observable banding and definition of fine details was equally good on output from both models, but the Canon model produced the more vibrant colours, overall.

Direct Print Submission Functionality

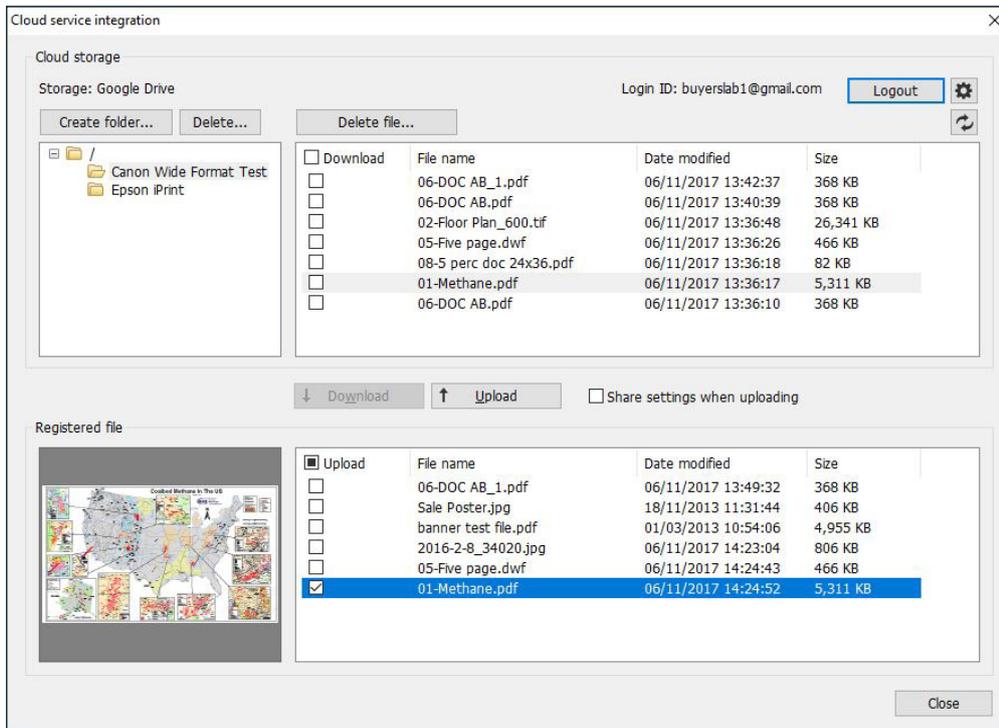
Advantage ✓	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Ease of Use	=	=
Direct Print Submission Functionality	=	=
Mobile App Integration		✓

- O Available as a free download from Canon’s website, the 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. Via the utility, users can preview print layouts and select print settings without the need to open up the driver properties. For added convenience, it also lets users print multiple files simultaneously.



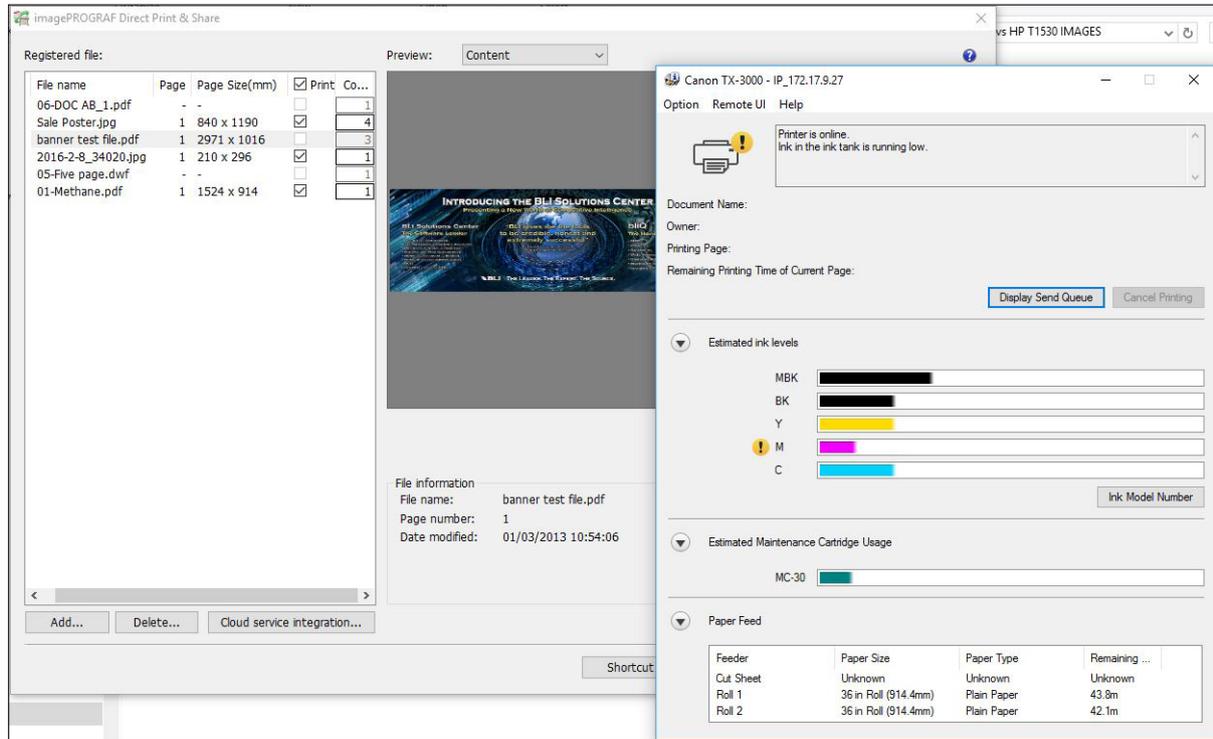
Canon’s imagePROGRAF Direct Print & Share utility gives users an image preview.

- The imagePROGRAF Direct Print & Share utility supports “Shortcut Print” functionality, enabling users to create a desktop shortcut that includes commonly used print settings. Akin to a hot folder workflow, files are automatically printed with the predefined settings when users drag-and-drop the files to the desktop icon. Multiple desktop icons can be created for different print settings or combinations of print settings.



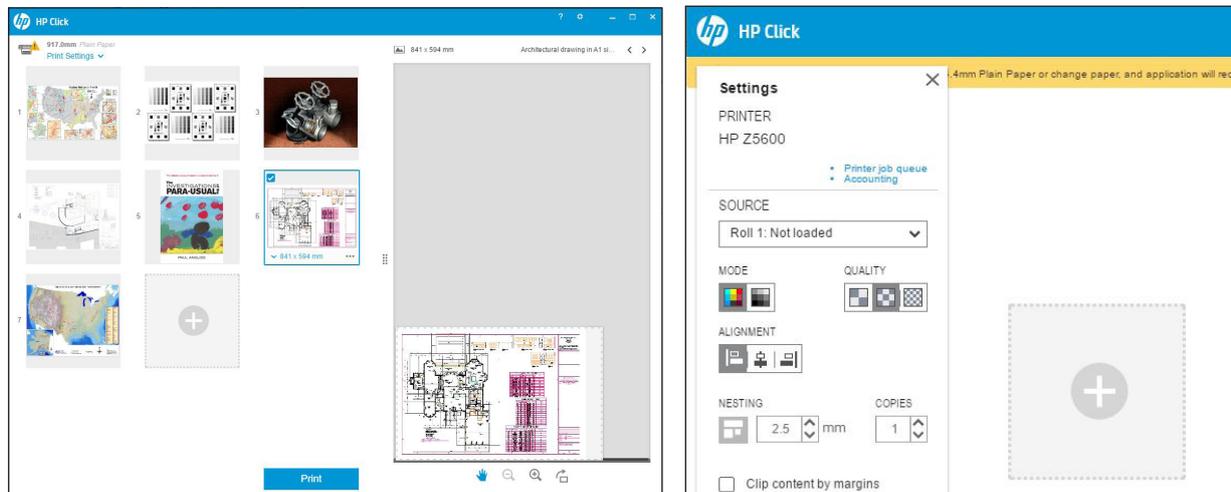
Retrieving files from Google Cloud using imagePROGRAF Direct Print & Share.

- Users can download stored files from Google Drive and AutoCAD 360 cloud storage services for printing via the imagePROGRAF Direct Print & Share utility, and can also upload files directly to cloud storage as well, which boosts collaboration. For added convenience, the utility also offers the option of sharing 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.



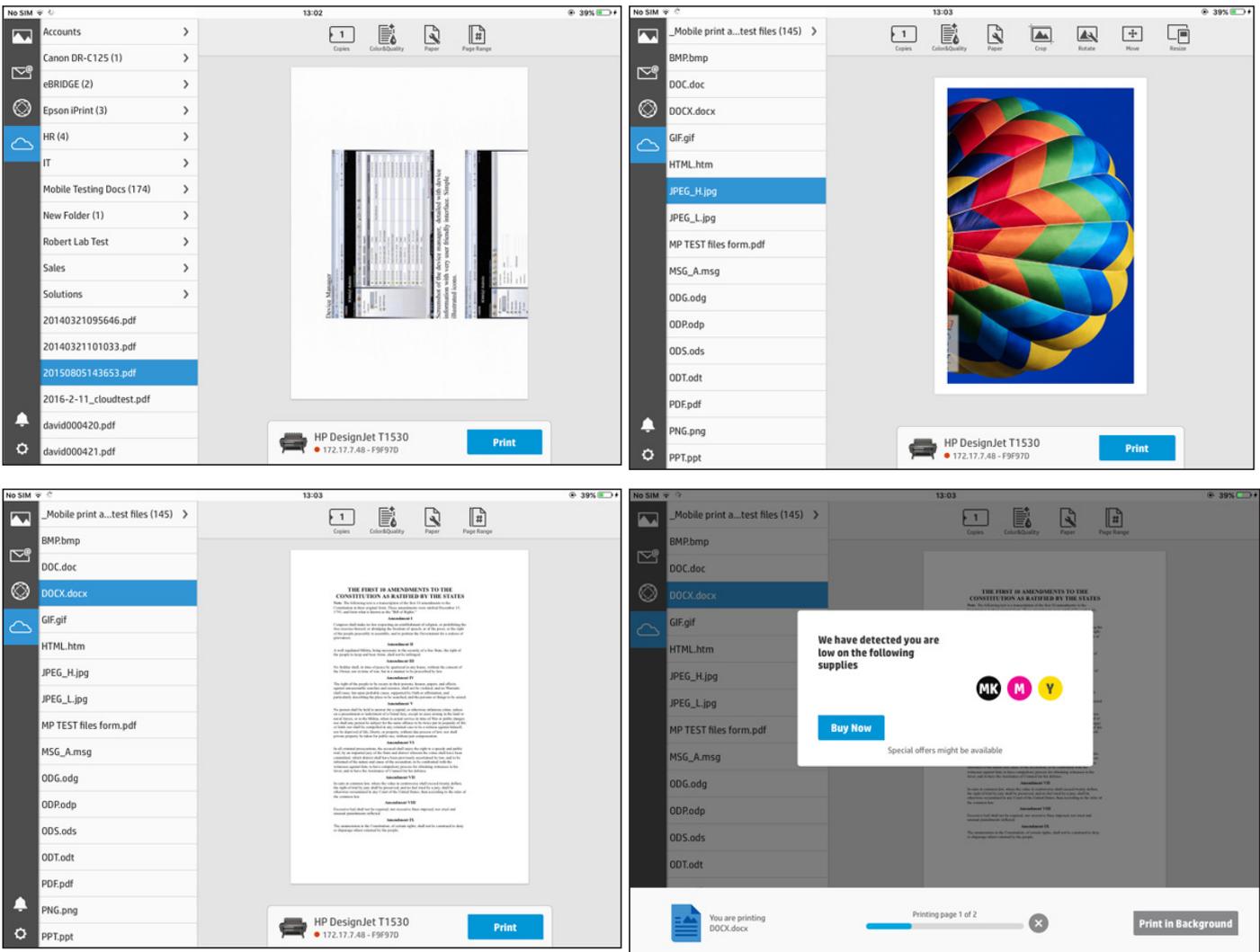
Users can view device status information via the imagePROGRAF Direct Print & Share utility.

- Available as a free download, HP Click printing software allows direct printing of PDF, JPEG, TIFF and HPGL/2 files from the PC desktop, without the need for native applications or print drivers. Via the utility, users can preview print layouts, resize and align images without the need to open up the driver properties. It also has an automatic nesting feature to reduce waste.



Via HP Click, users can select basic print settings, preview images, manipulate images as well as utilise the automatic nesting feature to reduce paper waste.

- The HP Mobile Printing service allows users to print directly from an iOS or Android smart device to a compatible HP large-format device. Unlike the previous version (ePrint & Share), users do not need to create an account in order to access direct print functionality. Instead, the mobile device quickly pairs with the printer via a wireless network connection or by Wi-Fi Direct for direct job submission. Android users have the extra step, however, of downloading and enabling the free HP Print Service Plugin app, which is available from Google Play, before being able to access the HP Mobile Printing service. Users can print a wide selection of file formats such as Microsoft Office documents, as well as PDF, JPEG and TIFF files. Whether the file is stored locally on the device, in a cloud service account or sent as an email attachment, the user just needs to open the file and select the Share option, which then allows them to select and send the job to their preferred HP printer.



The HP Mobile Printing service enables Android and iOS mobile devices to pair with the T1530 and other compatible HP devices easily. Users can retrieve files from cloud storage, preview images and perform image adjustments.

- In addition, the HP T1530 supports HP ePrint functionality, whereby users are able to send print jobs remotely by email either via a workstation PC or a mobile device; PDF, TIFF and JPEG files (up to 10 MB) are supported.
- The Canon TX large format series supports Canon Print Service, a mobile print app for Android users (with support for Apple iPad devices to follow in 2018), which is a productivity boost in environments where workers are travelling between sites or working flexibly.

Ink Consumption

Overall Weight of Ink Used (in Grams)

	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Cottage Architectural Plan	38.4	42.8
ISO Office Poster	82.6	105.3
GIS Map	74.5	106.4

Results are averaged across three sets of 50-page A0 printing in Standard/Normal mode.

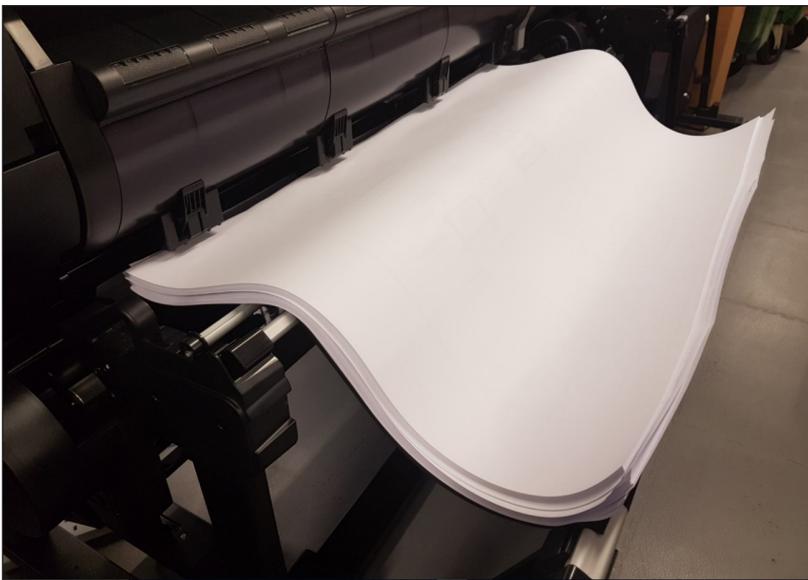
- + When producing 50 prints of a Cottage Architectural Plan in Standard/Normal Mode, the Canon unit used 10.3% less ink than the HP T1530.
- + When printing an ISO Poster in Standard/Normal Mode, the Canon unit used 21.5% less ink compared with the HP device.
- + In the GIS Map ink consumption test conducted in Standard/Normal Mode, the Canon TX-3000 used 29.9% less ink compared with the HP device.

Device Feature Set

- + The total capacity of the Canon TX-3000's starter ink cartridges is 970 ml, which is far higher than the 240 ml total starter ink volume available with the HP model.
- + Canon's replacement ink cartridge capacities are 160 ml, 330 ml and 700 ml for all colours, whereas the HP model offers 130 ml and 300 ml for all colours, and as a consequence they will need replacing less frequently than with the HP device.
- + As noted above, Canon's ink cartridges are replaceable during operation, which helps reduce downtime. HP's cartridges cannot be replaced during operation.
- + If the Canon device detects that printhead nozzles are becoming clogged, it automatically starts a cleaning routine when there are no nozzles available to compensate for the clogged ones. This task would have to be done manually with the HP unit, although Buyers Lab analysts did not encounter any nozzle clogging issues with either model during testing.
- O Both units utilise a single user-replaceable printhead, taking less than five minutes to replace on both models.
- + The Canon unit supports a higher maximum cut-sheet media length of 1.6 m compared with 1.2 m for the HP unit.
- O Both models offer USB 2.0 and Gigabit Ethernet connectivity.
- O For maximum convenience and minimum downtime, both models offer the advantage of a dual-roll design, which gives users added flexibility to switch between different media types or sizes without having to reload the media each time.
- + Buyers Lab analysts noted that the TX-3000'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. This option is not available for the HP device.

- Both models also provide excellent ease of access when loading or unloading the second roll.
- The Canon device includes a media mismatch option, which places jobs on hold that can't be printed due to the required media not being loaded, while jobs that can be completed are automatically 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 as well as a control panel warning after it is submitted. The control panel's "Paper mismatch action" allows users either to put the job on hold or print it; all jobs which are slated for the paper types that are already loaded will be printed without delay.
- + The Canon model offers a standard, non-upgradable RAM capacity of 128 GB, while the HP unit has a standard non-upgradeable RAM capacity of 96 GB.
- Both models come with a 500-GB hard drive as standard.
- + The Canon TX-3000 supports borderless printing regardless of what roll media type is being used, whilst the HP T1530 only supports this feature when photo paper is selected.
- + The Canon TX-3000 supports up to 0.8 mm media thickness for roll paper and 170 mm as the outside diameter of the roll, while the HP T1530 supports up to 0.5 mm in media thickness and 140 mm in diameter.
- + The Canon TX-3000 comes with robust security features, including newly added hard drive encryption and protocol locking to prevent unauthorised access to the device; it also supports SNMP v3 (secure network protocol) and IPsec that provides further security by authenticating and encrypting data over the network. The HP T1530 supports IPsec, 802.1x, SNMPv3, PIN printing as well as optional Secure Disk Erase, which lets users choose whether to erase particular files or the whole hard drive.
- The Canon model is heavier (105 kg versus 88 kg) and less compact than the HP unit.
- Both models offer a colour touchscreen user interface, which are similarly responsive and intuitive to navigate.
- + The Canon TX-3000's power consumption while active is lower—105 watts versus 120 watts—than that of the HP model.
- However, in standby mode (where it may spend more of its time) the HP T1530's power consumption is lower (1.3 watts versus the Canon model's 3.6 watts).
- Rated noise emissions are higher for the Canon model (51 dB) compared to the HP device (47 dB) while the devices are printing.
- + However, in standby mode, rated noise emissions are slightly lower for the Canon model than the HP unit (35 dB versus 39 dB).
- + The Canon TX-3000's high-capacity stacker can accommodate up to 100 A0-sized CAD prints (depending on paper weight and thickness); the HP T1530's integrated stacker has a lower advertised capacity of up to 50 printed sheets.
- While Canon's high-capacity stacker is better suited for stacking CAD drawings, the HP unit stacks any type of output (CAD or poster prints) in a consistent manner.
- + Both models will accept jobs that are larger than their advertised stacker capacities as Buyers Lab technicians noted when they sent a 120-page (CAD) job and a 60-page job to the Canon and HP devices, respectively. The Canon model completed the 120-page job but the HP model signalled its stacker was full after completing 42 sheets.
- When printing Buyers Lab's test using variously-sized media (A1 and A0), both models handled the jobs very well and neatly stacked them in the order of jobs sent so no re-sorting or manual intervention was required—a valuable time-saver.
- Unloading the stacker is an easy and straightforward task on both devices, taking no more than 10 seconds to open or lift the stacker and remove printouts.

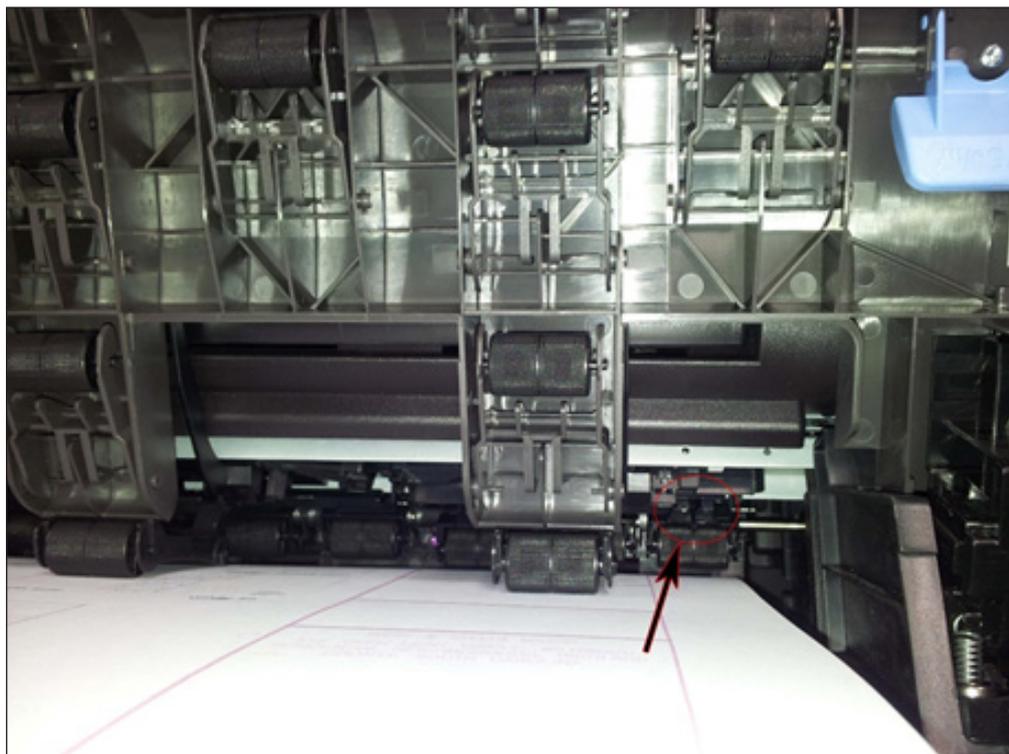
- + However, printed sheets cannot be released from HP's stacker assembly while the unit is printing, unlike with the Canon TX-3000.
- While the Canon model's high-capacity stacker assembly is easy to wheel up and slide in to attach to the main unit, it requires a larger office footprint. The HP unit with its integrated rear-mounted stacker is much more compact. Unlike with the HP unit, operators have to remove the stacker assembly from the Canon unit in order to load rolls at the front of the device.
- Notably, the HP unit's stacker has a built-in paper sensor, which detects when the stacker capacity threshold has been reached. The device subsequently stops printing to allow the operator to remove printouts before resuming the job automatically. Conversely, the Canon TX-3000 will continue to print when its stacker capacity has been reached, which could lead to potential paper jamming and spillage issues. Therefore, Canon operators will need to be more vigilant to avoid such scenarios, although it's assumed that the operator would unload the stacker before it reached this stage.



Although it took several attempts to install the stacker in the right configuration, Buyers Lab technicians noted the Canon TX-3000's stacker assembly at the front of the device held printed A0 and A1 sheets in good alignment.



The HP T1530's stacker assembly, located at the top rear of the device, holds printed sheets in perfect alignment. As it is a smaller stacker, A1 printouts hang over the edge but as they are held firmly in place, there were no issues experienced.



A plus in the HP stacker's favour is its built-in sensor (circled) which detects when the stacker basket has reached its page limit and will pause the job, allowing the operator to unload the stacker, after which it resumes automatically.

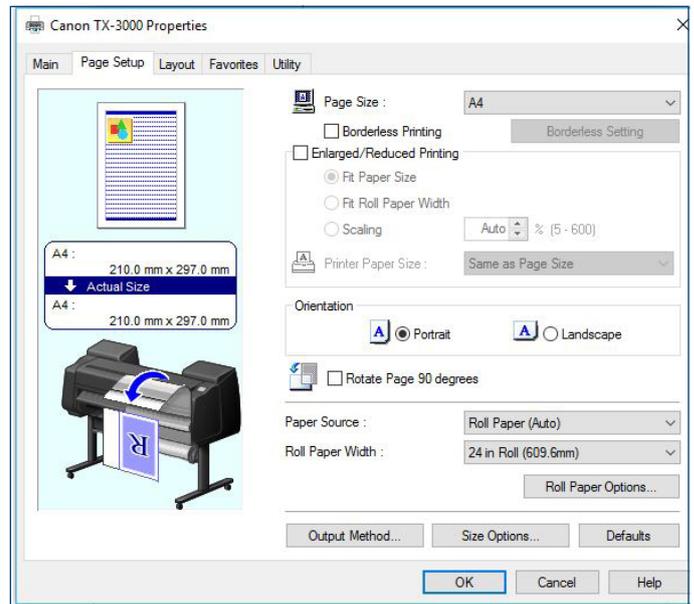
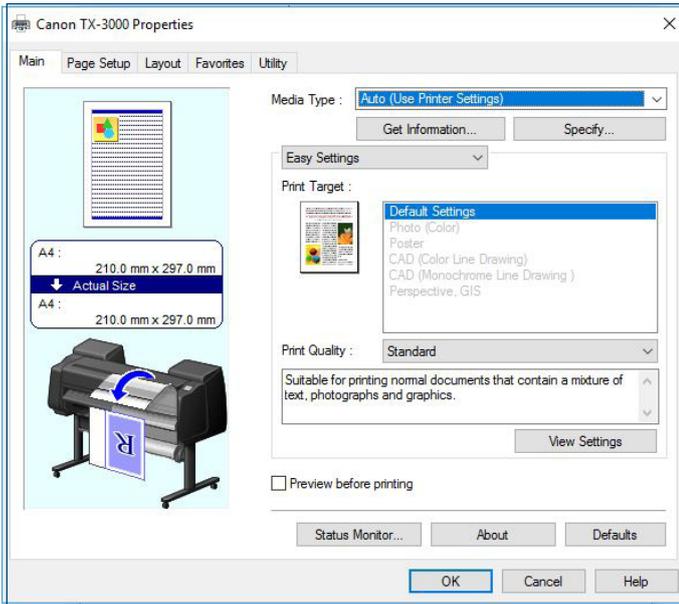
Device Feature Set

- + The Canon TX-3000 has five speed settings (Fast 300, Standard 600, Fast 600, High 600 and High 1200), which are matched by three settings on the HP device (Fast, Normal and Best), although not all speed settings are available with all media types on the Canon model.
- O Both the Canon imagePROGRAF Printer Driver and the HP-GL/2 driver provide a useful overview of the settings for predefined profiles.
- + Six predefined profiles are available with the Canon driver, while the HP driver offers a smaller range of four settings.
- + The Canon driver supports multi-up (2 to 16) printing, while the HP driver does not support multi-up printing.
- + The Canon driver offers a 2 by 2 poster mode, while the HP model does not offer support for poster printing.
- The Canon driver offers page stamping (Date, Time, Name and Page Number); the HP driver also enables custom stamps to be created in addition to these.
- O The Canon imagePROGRAF Printer Driver offers a broad range of built-in adjustments for CMY balance, brightness and contrast, while the HP T1530's HP-GL/2 driver also offers settings for CMY balance and brightness adjustments. The Canon driver contains advanced colour-matching capabilities that include the

ability to match ICC profiles and select the rendering intent based on different elements in the document. A wide range of colour management profiles are available when the HP driver and colour management tools (from the Printing Preferences menu) are downloaded from HP's website. Additionally, users can preview images before printing—features which were not included in the Startup driver disk supplied to Buyers Lab with the device.

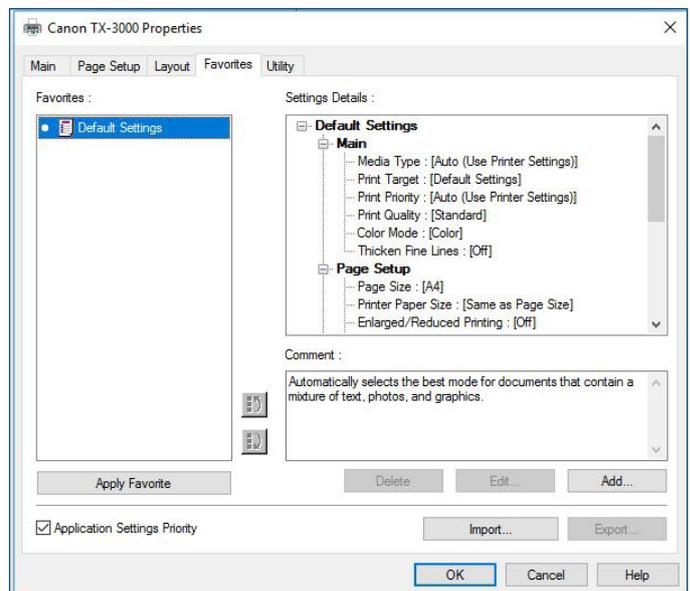
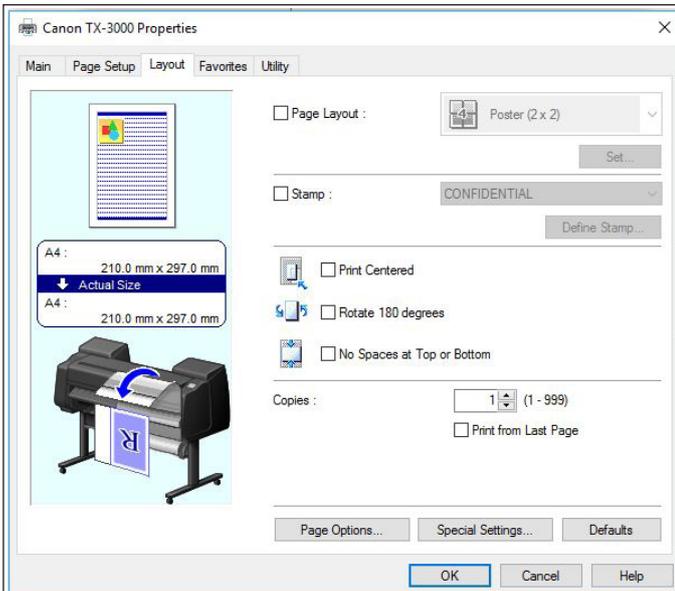
- + The Canon driver offers the option of unidirectional printing, even in Fast mode, which helps to avoid banding across output because the printhead travels in only one direction to create the desired image. The HP driver does not offer this feature.
- + The Canon driver includes the Color imageRUNNER Enlargement Copy Mode utility, which is standard with the 32-bit version of the driver and is available as a download for the 64-bit version of the driver via the Printer Driver Extra Kit. This enables users to integrate a Canon small-format MFP device with the TX-3000, whereby documents scanned at the MFP are automatically routed to a hot folder that is monitored by the TX-3000 driver. The image is then resized and printed, offering a fast, easy-to-use poster creation tool for office users.
- + The Canon driver also includes the Free Layout nesting tool (also available as a free download via the Printer Driver Extra Kit) that enables files—even those created with different applications—to be scaled, resized, or grouped together as a single job from the printer driver. Images can be dragged and dropped to the desired locations and printed together on a single page, helping to save on paper. The HP unit offers a similar nesting feature, which can be activated directly on the control panel or from the print driver utility. However, unlike the Canon tool, it does not allow users to have precise control over the positioning of jobs, rather it will randomly position jobs to print across the width of a page, either in the order jobs were sent or in 'optimized' layout order.
- + The Canon model also 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.
- O Canon's Accounting Manager, accessed via the Status Monitor, offers comprehensive accounting management for all 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. HP offers similar accounting management and tracking capabilities via the Accounting tab on its embedded web server page, or via the HP DesignJet Excel Accounting tool, which is available as a free download.

Test Models' Print Driver Screenshots



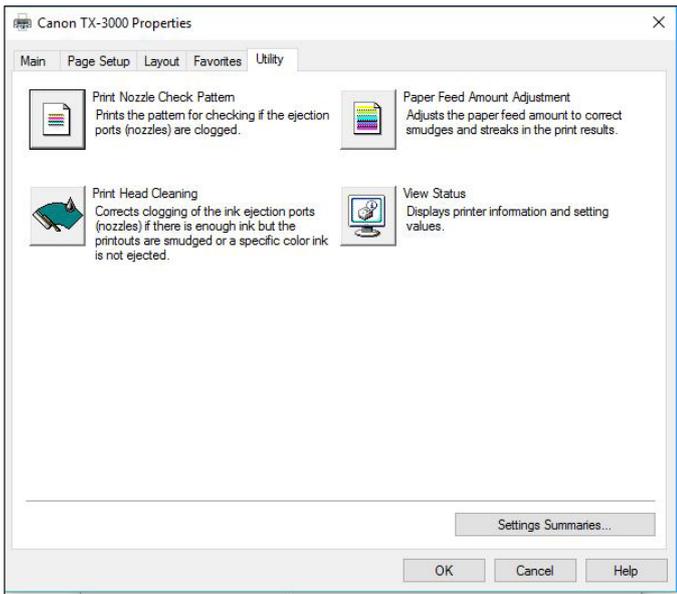
Canon imagePROGRAF TX-3000 Print Driver Main Tab

Canon imagePROGRAF TX-3000 Print Driver Page Setup Tab

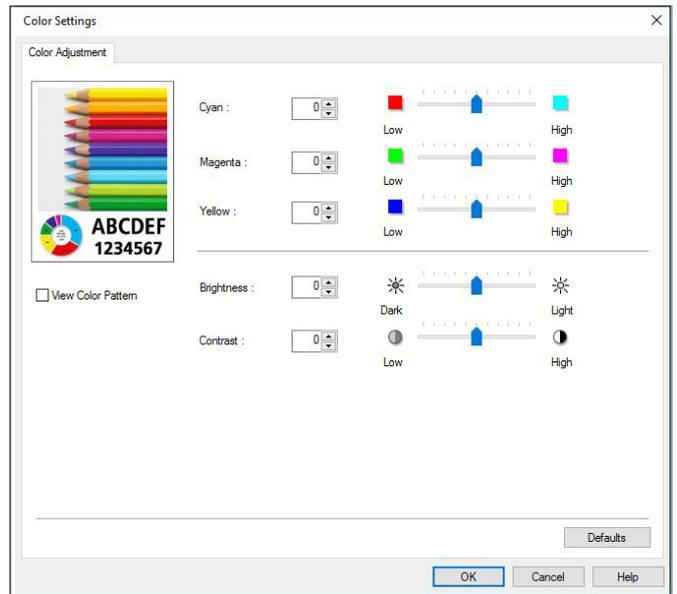


Canon imagePROGRAF TX-3000 Print Driver Layout Tab

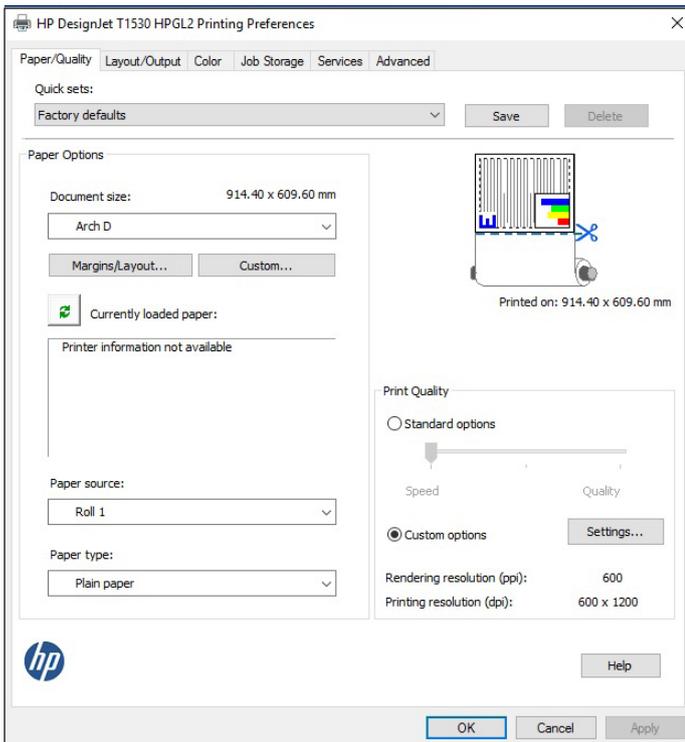
Canon imagePROGRAF TX-3000 Print Driver Favourites Tab



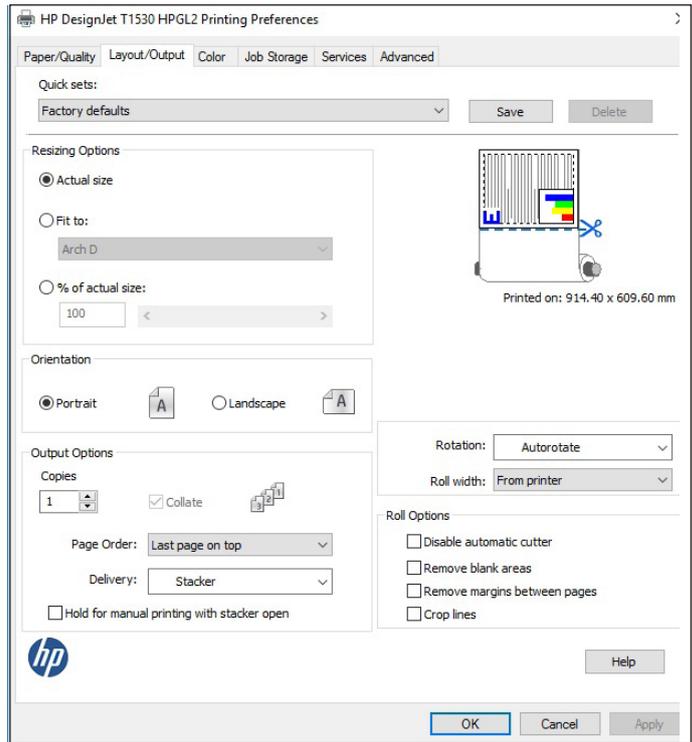
Canon imagePROGRAF TX-3000 Print Driver Utility Tab



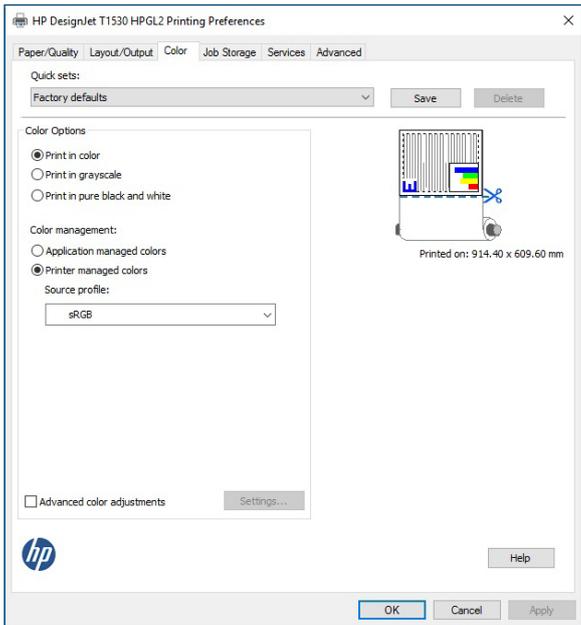
Canon imagePROGRAF TX-3000 Print Driver Colour Adjustment Tab



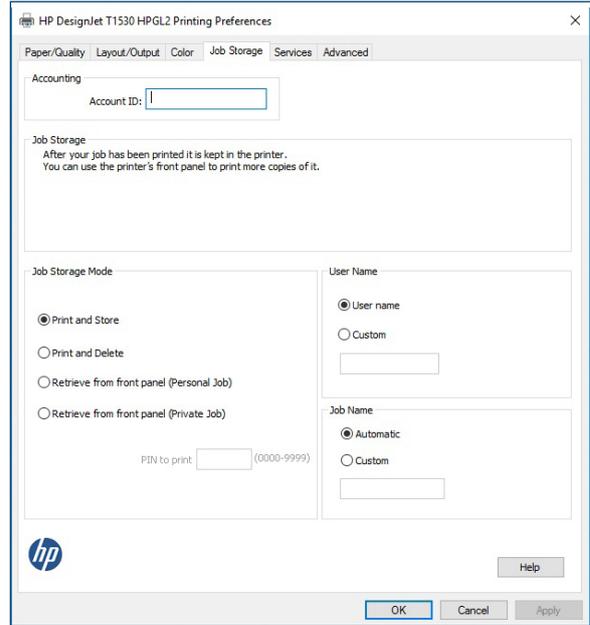
HP DesignJet T1530 Print Driver Paper/Quality Tab



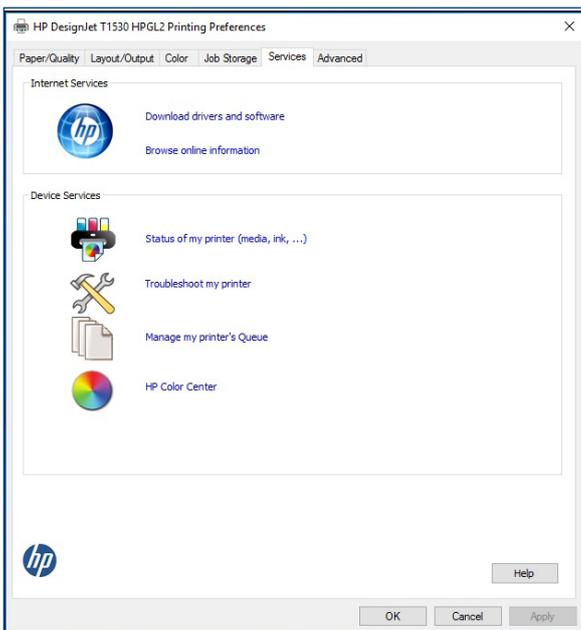
HP DesignJet T1530 Print Driver Layout/Output Tab



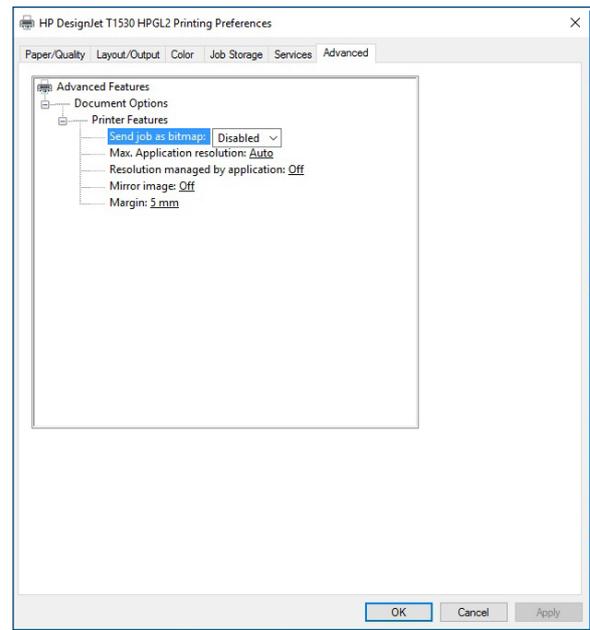
HP DesignJet T1530 Print Driver Colour Tab



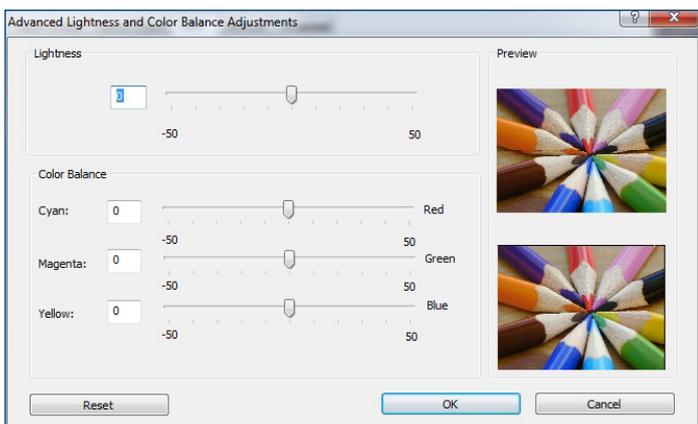
HP DesignJet T1530 Print Driver Job Storage Tab



HP DesignJet T1530 Print Driver Services Tab



HP DesignJet T1530 Print Driver Advanced Tab



HP DesignJet T1530 Print Driver Advanced Lightness and Colour Balance Adjustments

SUPPORTING TEST DATA

Print Productivity

Job Stream Productivity (in Seconds)

Mixed File Types, Same Size, Single Roll

Canon imagePROGRAF TX-3000		HP DesignJet T1530	
Fast	616.09	Fast	675.03
Standard	1,054.74	Normal	1,583.30
High	1,897.28	Best	4,075.06

Buyers Lab's job stream consists of nine files, including PDF, TIFF and DWF files totalling 19 pages, all at Arch D-size, ensuring that the files are set to fit to page. This test replicates the type of traffic a typical wide-format device might experience in a real-world, multi-user environment. All of the files are submitted to the controller in a specific order and sent to the printer as a group, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Both devices were loaded with 914 mm rolls, with each file set to auto-rotate to save media.

Mixed File Types, Same Size, Dual Roll

Canon imagePROGRAF TX-3000		HP DesignJet T1530	
Fast	789.94	Fast	848.00

Buyers Lab's dual-roll job stream consists of nine files, including PDF, TIFF and DWF files totalling 19 pages, all at Arch D-size, ensuring that the files are set to fit to page. This test replicates the type of traffic a typical wide-format device might experience in a real-world, multi-user environment. All of the files are submitted to the controller in a specific order and sent to the printer as a group, sending alternate jobs to different rolls, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Both devices were loaded with 914 mm rolls.

Colour Productivity (in Seconds)

Canon imagePROGRAF TX-3000		HP DesignJet T1530	
Fast	373.70	Fast	408.12
Standard	690.28	Normal	1,035.12
High	1,231.69	Best	2,653.41

The 12-page DWF test file was printed using the device driver set to the plain paper/colour setting. Both devices were loaded with 914-mm rolls. The actual time indicated is the time it took to RIP, image and deliver all pages of the test document to the collection bin.

Monochrome Productivity (in Seconds)

Canon imagePROGRAF TX-3000		HP DesignJet T1530	
Fast	373.01	Fast	402.84
Standard	687.69	Normal	1,028.95
High	1,227.85	Best	2,622.84

The 12-page DWF test file was printed with the Canon driver set to the plain paper/monochrome setting and the HP driver set to plain paper, black mode. Both devices were loaded with 914-mm rolls. The actual time indicated is the time it took to RIP, image and deliver all pages of the test document to the collection bin.

First-Page-Out Productivity after a Weekend of Non-Use (in Seconds)

	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Time Before Printing Commences	62.25	101.19
First Page Out	86.28	172.01

First-Page-Out Productivity from Ready State (in Seconds)

	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Time Before Printing Commences	22.53	15.83
First Page Out	45.53	86.72

First-page-out times are achieved by sending an Arch D-size PDF file to print in Fast mode, timed from release to page out with the Canon driver set to the plain paper/monochrome setting and the HP driver set to plain paper, black mode. Both devices were loaded with 914-mm rolls.

A0 First-Page-Out and Throughput Productivity (in Seconds)

	Canon imagePROGRAF TX-3000	HP DesignJet T1530
First Page Out	114.10	150.17
Five Pages Out	497.09	716.64

The single-page A0-size Cottage Architectural Plan DWG TrueView Drawing test file was printed using the device driver with the plain paper/colour setting in Standard/Normal mode. The actual time indicated is the time it took to RIP, image and deliver five pages of the test document to the collection bin.

Colour Print Quality

Colour Optical Density Evaluation

Canon imagePROGRAF TX-3000						
	Fast		Standard		High	
	50%	100%	50%	100%	50%	100%
Cyan	0.41	0.87	0.50	1.03	0.52	1.09
Magenta	0.35	0.72	0.42	0.86	0.43	0.95
Yellow	0.32	0.72	0.38	0.86	0.40	0.92
Black	0.44	1.42	0.54	1.35	0.55	1.36

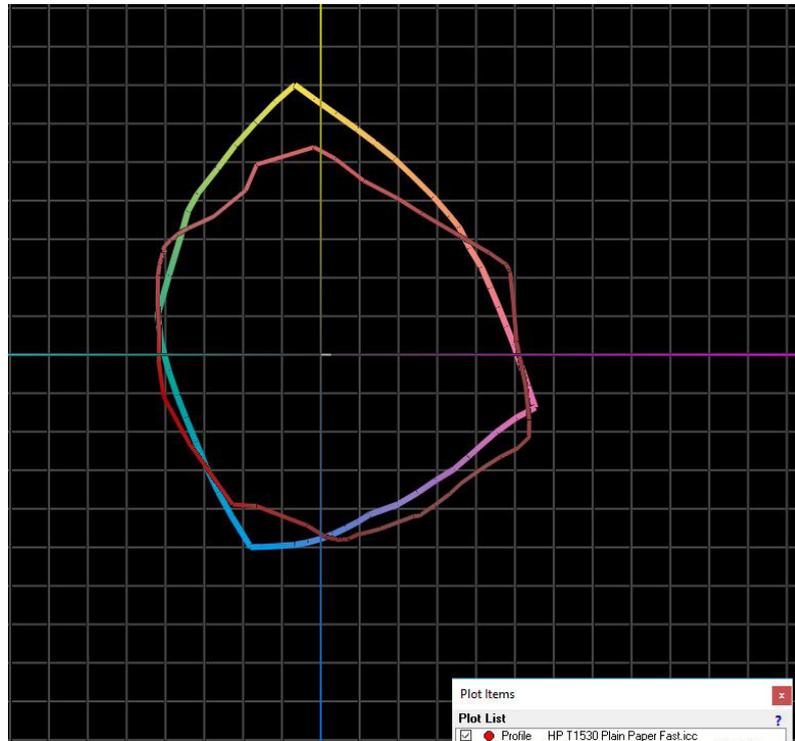
HP DesignJet T1530						
	Fast		Normal		Best	
	50%	100%	50%	100%	50%	100%
Cyan	0.39	0.74	0.45	0.85	0.51	0.98
Magenta	0.51	0.83	0.58	0.86	0.60	0.99
Yellow	0.58	0.77	0.65	0.87	0.65	0.99
Black	0.57	1.47	0.62	1.52	0.60	1.39

Note: Colour density readings were assessed by printing a Buyers Lab proprietary PDF test target file on Plain Paper in default colour settings at all quality settings available, and measuring the density of 100% dot fill and 50% dot fill using an XRite 508 densitometer and XRite exact^{XP} densitometer.

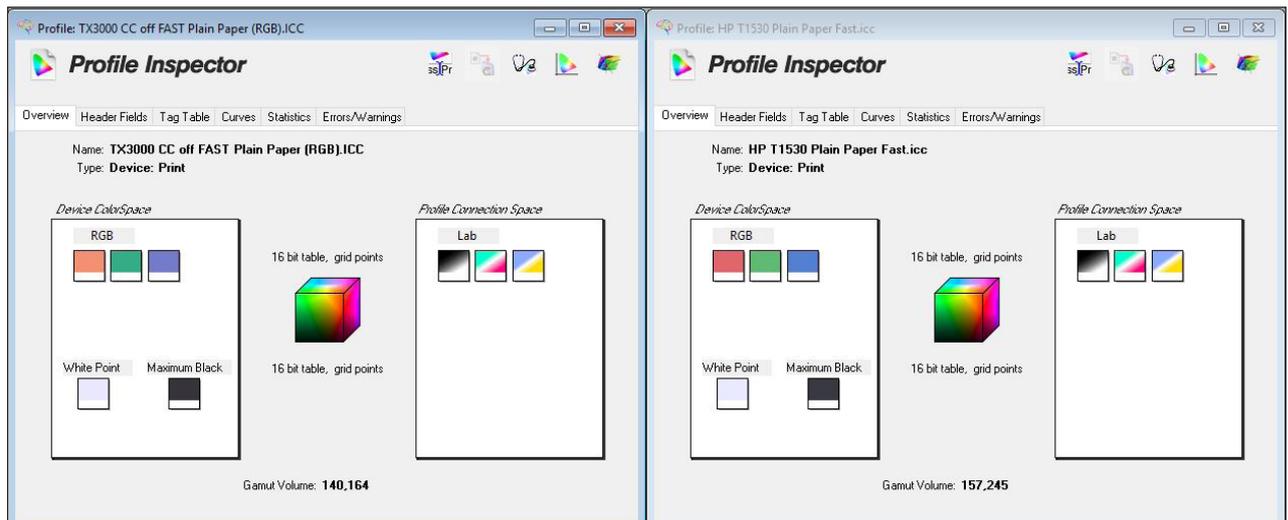
Colour Gamut Comparisons

Media Type/Settings	Canon imagePROGRAF TX-3000	HP DesignJet T1530
Plain Paper Fast	140,164	157,245
Plain Paper Standard/Normal	208,945	160,331
Plain Paper High/Best	229,826	184,281
Matte Coated High/Best	402,815	279,864

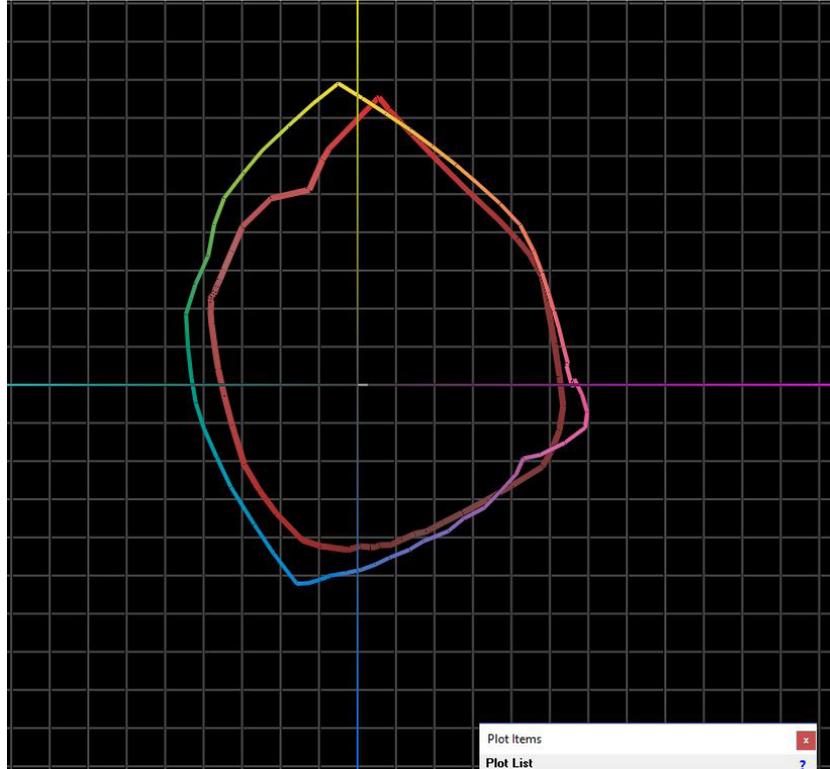
Colour Gamut Comparison



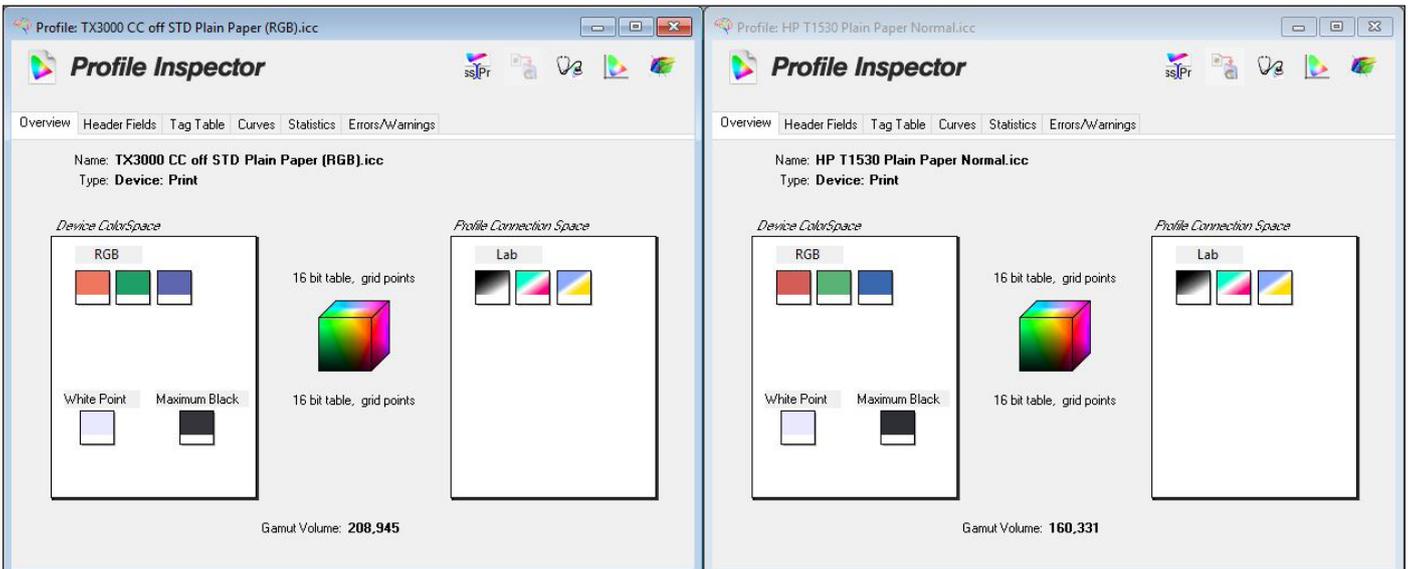
Canon imagePROGRAF TX-3000 colour gamut on plain paper in Fast settings (shown chromatically) versus HP DesignJet T1530 colour gamut (shown in red) on plain paper in Fast settings.



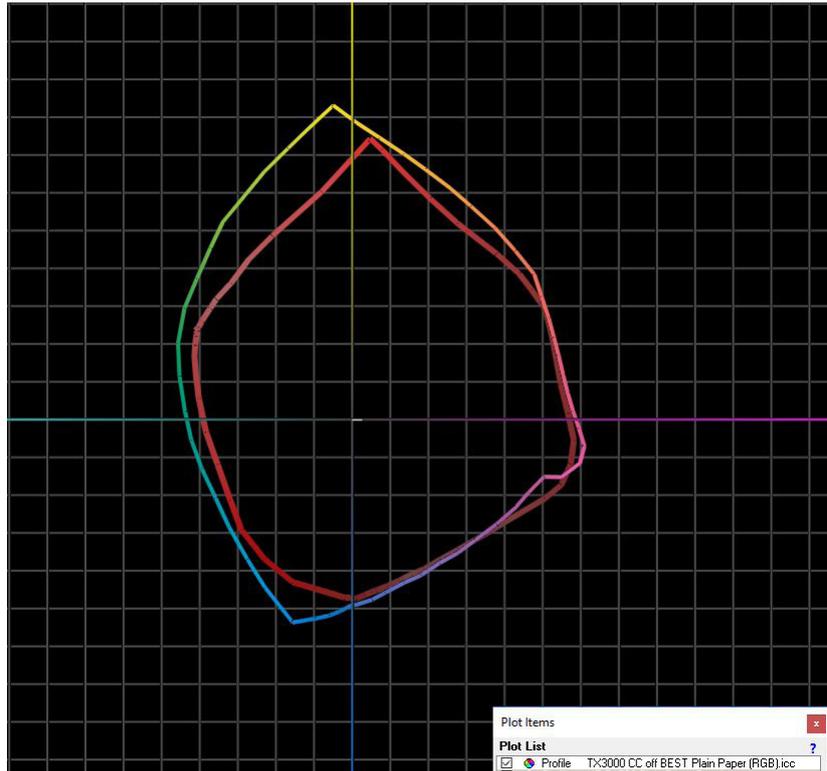
Colour gamut profile for Canon imagePROGRAF TX-3000 (left) and HP DesignJet T1530 (right) on plain paper in Fast mode.



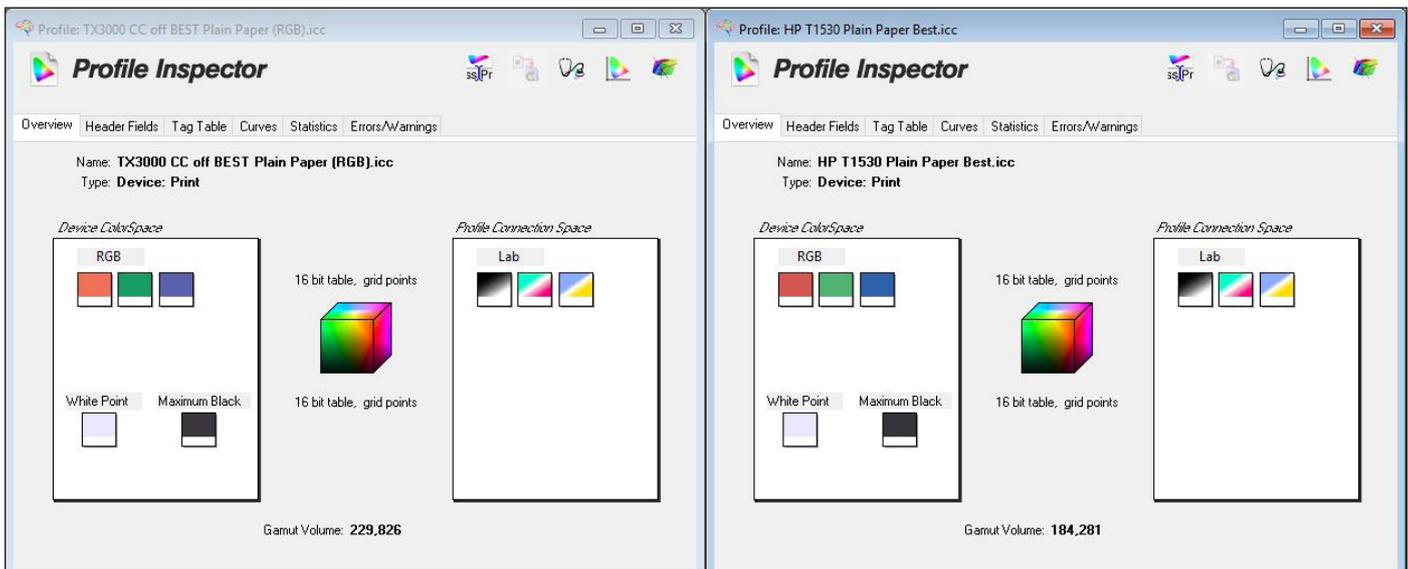
Canon imagePROGRAF TX-3000 colour gamut on plain paper in Standard settings (shown chromatically) versus HP DesignJet T1530 colour gamut on plain paper in Normal settings.



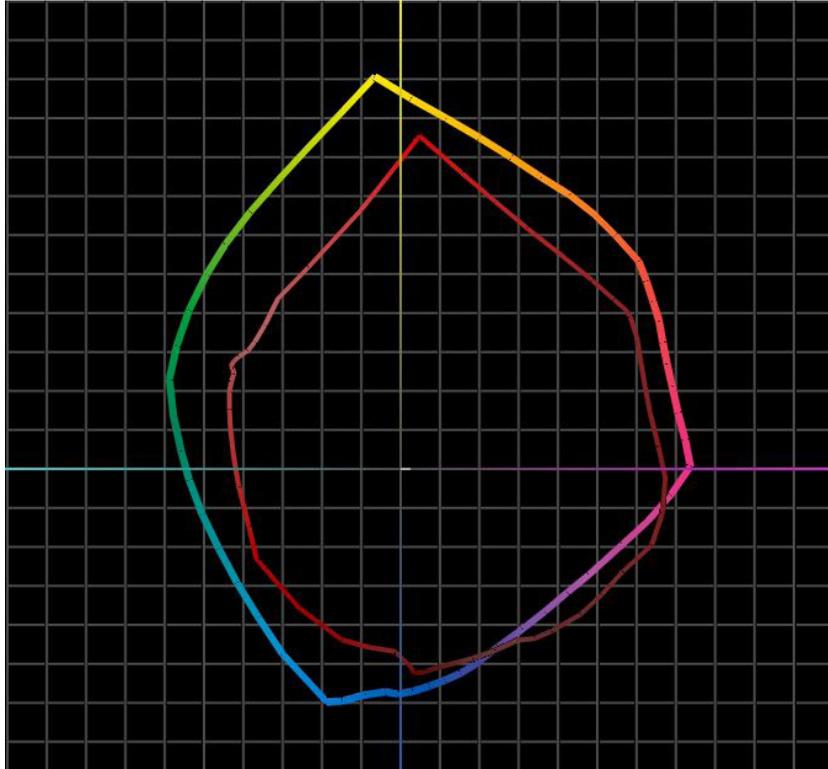
Colour gamut profile for Canon imagePROGRAF TX-3000 (left) and HP DesignJet T1530 (right) on plain paper in Standard/Normal modes.



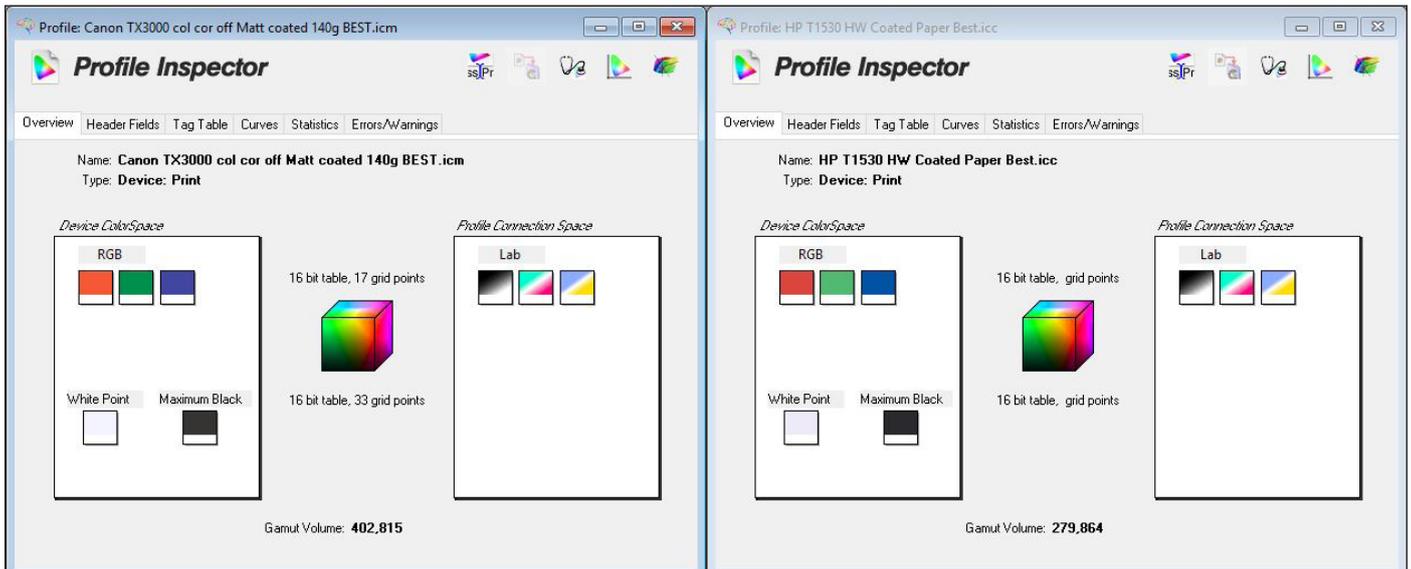
Canon imagePROGRAF TX-3000 colour gamut on plain paper in High settings (shown chromatically) versus HP DesignJet T1530 colour gamut (shown in red) on plain paper in Best settings.



Colour gamut profile for Canon imagePROGRAF TX-3000 (left) and HP DesignJet T1530 (right) on plain paper in High/Best Quality modes.



Canon imagePROGRAF TX-3000 colour gamut on matte coated paper in High quality settings (shown chromatically) versus HP DesignJet T1530 colour gamut (shown in red) on matte coated paper in Best settings.



Colour gamut profile for Canon imagePROGRAF TX-3000 (left) and HP DesignJet T1530 (right) on matte coated paper in High/Best Quality modes.

Black Print Quality

Solid Density

Canon imagePROGRAF TX-3000				HP DesignJet T1530		
Density Block						
	Fast	Standard	High	Fast	Normal	Best
1	1.42	1.39	1.40	1.53	1.57	1.44
2	1.43	1.36	1.36	1.52	1.56	1.39
3	1.45	1.41	1.34	1.55	1.58	1.47
4	1.45	1.45	1.39	1.55	1.55	1.45

Note: Solid black density measurements are based on four readings taken from a Buyers Lab proprietary PDF test target file corresponding to four different 100% solid black locations on the output. The output was assessed at all quality settings available, with the Canon driver set to plain paper/monochrome setting and the HP driver set to plain paper, black mode. Density was measured using an XRite 508 densitometer and XRite exact^{XP} densitometer.

Device Feature Set

	Canon imagePROGRAF TX-3000	Advantage	HP DesignJet T1530
Max. image resolution	2400 x 1200 dpi		2400 x 1200 dpi
Number of inks	5	✓	6
Ink tanks replaceable during operation	Yes	✓	No
Ink-drop size	5 picoliter	✓	6 picoliter (C, M, Y, G, PBK); 9 picoliter (MBK)
Ink capacity out of the box	970 ml (330 ml MBK; 160 ml CMYK)	✓	240 ml (40 ml x 6)
Ink cartridge capacity	160/330/700 ml (CMYK, MBK)	✓	130/300 ml (CMY, G, PBK, MBK)
Number of nozzles	MBK: 5,120 nozzles; other colours: 2,560 nozzles each; 15,360 in total	✓	MBK: 2,752; other colours: 1,376 each; 9,632 in total
Number of printheads	1 (User-replaceable)		1 (User-replaceable)
Line accuracy	+/-0.1%		+/-0.1%
Minimum line width	0.02 mm		0.02 mm
Minimum print margins	3 mm		3 mm
Borderless (0 mm) printing	Yes (Roll only)	✓	Yes (with Photo paper only)
Maximum outside diameter of roll paper	170 mm	✓	140 mm
Maximum printable paper roll length	18 m (depending on OS and application)		INA
Maximum cut-sheet media length	1.6 m	✓	1.2 m
Maximum media thickness for roll paper	0.8 mm	✓	0.5 mm
Maximum media width	914 mm (36 inches)		914 mm (36 inches)
Media loading	Top and Front Loading Slot for Sheet Paper		Front

	Canon imagePROGRAF TX-3000	Advantage		HP DesignJet T1530
Roll paper	Optional Multifunction Roll System (with auto take up)	✓		Optional dual
Optional media handling	Roll holder set			Roll media adapter
High-capacity stacker assembly	100 sheets	✓		50 sheets
Stacker capacity sensor	No		✓✓	Yes
Standard RAM	128 GB	✓		96 GB
Maximum RAM	128 GB	✓		96 GB
Hard drive	500 GB (Standard)			500 GB (Standard)
Interface	Hi-Speed USB; 10/100/1000Base-T/TX Ethernet; USB 2.0	✓		1000Base-T Ethernet, USB 2.0
PDL	HP-GL/2, HP RTL		✓	HP-GL/2, HP-RTL, TIFF, JPEG, CALS G4, HP PCL 3 GUI, URF
Net weight (unpacked)	105 kg			88 kg
Power consumption when in standby	3.6 W		✓	1.3 W
Power consumption when active	105 W	✓		120 W
Acoustic pressure	Operation: 51 dB (A); Standby: 35 dB (A)			Operation: 47 dB (A); Standby: 39 dB (A)
Acoustic power	INA			Operation: 6.5 Bels; Ready: 5.8 B(A)

Driver Feature Set

	Canon imagePROGRAF TX-3000	Advantage		HP DesignJet T1530
Speed settings	5 (Fast 300, Fast 600, Standard 600, High 600 and 1200)	✓		3 (Fast, Normal and Best)
Economy mode	Yes			Yes (only in Fast mode)
Predefined profiles	6 (Default, Photo (colour), Poster, CAD (colour line drawing), CAD (mono line drawing) and Perspective GIS)	✓		4
Overview of profile settings provided	Yes			Yes
Media profiles	53 + 10 user customizable special options	✓		35
IQ optimized for print profiles	Yes			Yes
Watermark	Yes	✓		No
Sharpen text	Yes			Yes (Max. Detail setting)
Thicken fine lines	Yes			Yes (Max. Detail setting)
Mirror image	Yes			Yes
Multi-up printing	Yes, 2 to 16	✓		No

	Canon imagePROGRAF TX-3000	Advantage		HP DesignJet T1530
Poster print mode	Yes (2 by 2)	✓		No
Page stamping	Yes (Date, Time, Name, Page Number)		✓	Yes (Date, Time, Name, Page Number; plus the ability to add custom stamps)
Image rotation	Yes, 90 degrees and auto 180 degrees	✓		Yes, 90 degrees
Option to preview before print	Yes	✓		No
CMYK balance adjustment	Yes (CMY only)			Yes (CMY only)
Brightness adjustment	Yes			Yes
Contrast adjustment	Yes			Yes
Saturation adjustment	No			No
Advanced colour management options	Yes			Yes
Enlargement Copy Mode	Yes	✓		No
Free Layout Capability	Yes (flexible placement)	✓		Yes (automatic placement)
MS Office Plug-in	Yes	✓		No
Accounting capability	Yes			Yes
Disable automatic cutter	Yes			Yes
Unidirectional printing selection option	Yes	✓		No
Integration with MFP	Yes	✓		No

The Canon imagePROGRAF TX-3000 comes bundled with PosterArtist Lite.

Ink Consumption

Table 1: Amount of Ink in each Canon imagePROGRAF TX-3000 Cartridge (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Weight of cartridge prior to installation	952.9	777.6	805.8	786.2	785.2
Weight of cartridge at end of life	217.4	217.4	217.4	217.4	217.4
Net weight of ink	735.5	560.2	588.4	568.8	567.8
Total ink weight across five cartridges					3,020.7

Table 2: Amount of Ink in each HP DesignJet T1530 Cartridge (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Weight of cartridge prior to installation	193.0	189.9	194.2	191.5	191.2	191.9
Weight of cartridge at end of life	57.3	57.3	57.3	57.3	57.3	57.3
Net weight of ink	135.7	132.6	136.9	134.2	133.9	134.6
Total ink weight across six cartridges						807.9

Table 3: Ink Used in Three 50-Page Runs of Cottage Architectural Plan Test Document (Standard Mode) on the Canon imagePROGRAF TX-3000 (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Test Run 1 Net weight of ink used	19.1	5.0	3.8	5.0	5.3
Test Run 2 Net weight of ink used	18.5	5.3	4.0	5.5	5.1
Test Run 3 Net weight of ink used	19.3	5.3	4.3	4.9	4.8
Average amount of ink used across three runs	19.0	5.2	4.0	5.1	5.1
Total ink weight across five cartridges					38.4

Table 4: Ink Used in Three 50-Page Runs of Cottage Architectural Plan Test Document (Normal Mode) on the HP DesignJet T1530 (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Test Run 1 Net weight of ink used	0.3	0.8	26.5	8.8	3.5	1.7
Test Run 2 Net weight of ink used	0.5	0.5	26.9	9.2	3.6	1.7
Test Run 3 Net weight of ink used	0.8	0.9	27.7	9.4	3.8	2.2
Average amount of ink used across three runs	0.5	0.7	27.0	9.1	3.6	1.9
Total ink weight across six cartridges for 50-page run (based on averages)						42.8

Table 5: Ink Used in Three 50-Page Runs of ISO Poster Test Document (Standard Mode) on the Canon imagePROGRAF TX-3000 (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Test Run 1 Net weight of ink used	21.2	7.0	5.6	22.1	26.0
Test Run 2 Net weight of ink used	21.6	7.6	5.9	22.8	25.1
Test Run 3 Net weight of ink used	20.1	7.9	6.0	22.7	26.4
Average amount of ink used across three runs	21.0	7.5	5.8	22.5	25.8
Total ink weight across five cartridges					82.6

Table 6: Ink Used in Three 50-Page Runs of ISO Poster Test Document (Normal Mode) on the HP DesignJet T1530 (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Test Run 1 Net weight of ink used	1.2	5.3	20.1	55.3	23.1	7.8
Test Run 2 Net weight of ink used	0.5	4.2	20.6	55.0	15.7	4.4
Test Run 3 Net weight of ink used	0.6	4.2	20.6	54.6	18.3	4.4
Average amount of ink used across three runs	0.8	4.6	20.4	55.0	19.0	5.5
Total ink weight across six cartridges for 50-page run (based on averages)						105.3

Table 7: Ink Used in Three 50-Page Runs of GIS Map Test Document (Standard Mode) on the Canon imagePROGRAF TX-3000 (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Test Run 1 Net weight of ink used	22.4	3.9	12.3	15.1	20.7
Test Run 2 Net weight of ink used	25.8	3.2	11.0	17.2	22.7
Test Run 3 Net weight of ink used	26.9	3.0	7.6	13.4	18.3
Average amount of ink used across three runs	25.0	3.4	10.3	15.2	20.6
Total ink weight across five cartridges					74.5

Table 8: Ink Used in Three 50-page Runs of GIS Map Test Document (Normal Mode) on the HP DesignJet T1530 (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Test Run 1 Net weight of ink used	0.5	36.1	11.0	28.2	10.3	18.1
Test Run 2 Net weight of ink used	0.5	37.0	11.2	28.1	10.5	18.0
Test Run 3 Net weight of ink used	1.7	32.0	14.5	29.8	12.2	19.7
Average amount of ink used across three runs	0.9	35.0	12.2	28.7	11.0	18.6
Total ink weight across six cartridges for 50-page run (based on averages)						106.4

Ink Consumption Test Methodology Overview

Buyers Lab's ink consumption analysis was conducted using three document types (Cottage Architectural Plan, ISO Office Poster and a GIS map). Each document was formatted as a PDF (except for the Cottage Architectural Plan, which was formatted as a DWG TrueView Drawing) and sized at ISO A0.

The Canon imagePROGRAF TX-3000 was installed in Buyers Lab's lab with the latest "01.10" level of firmware (as of October 2017) and connected to a Windows 10 workstation using a 1000BaseT TCP/IP connection. The Canon imagePROGRAF Printer Driver was used for all testing with media selection set to plain paper and the image set to print at actual size. For the Cottage Architectural Plan, print priority settings were set to Line Drawing/Text with quality set to Standard (600 dpi). For the ISO Poster and the GIS map, print priority settings were set to Image with quality set to Standard (600 dpi)

The HP DesignJet T1530 was installed in Buyers Lab's lab with the latest "MRY_04_01_00.2" level of firmware (as of January 2016) and connected to a Windows 10 workstation using a 1000BaseT TCP/IP connection. The HP GL/2 driver was used for all testing and was left in default colour setting, with media selection set to plain paper and the image set to print at actual size. All three document types were printed with quality set to 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.

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, consisting of Windows 2008 and Microsoft Exchange servers, Windows 10 workstations, 10/100/1000BaseTX network switches and CAT6 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 XRite 508 and XRite exact^{XP} densitometers.

About Keypoint Intelligence - Buyers Lab

Keypoint Intelligence is a one-stop shop for the digital imaging industry. With our unparalleled tools and unmatched depth of knowledge, we cut through the noise of data to offer clients the unbiased insights and responsive tools they need in those mission-critical moments that define their products and empower their sales.

For over 50 years, Buyers Lab has been the global document imaging industry's resource for unbiased and reliable information, test data, and competitive selling tools. What started out as a consumer-based publication about office equipment has become an all-encompassing industry resource. Buyers Lab evolves in tandem with the ever-changing landscape of document imaging solutions, constantly updating our methods, expanding our offerings, and tracking cutting-edge developments.

For more information, please call David Sweetnam at +44 (0) 118 977 2000 or email him at david.sweetnam@keypointintelligence.com