Keypoint Intelligence Comparative Lab Test Report

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Advantage ✓	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Image Quality	✓	
Print Productivity	✓	
Banner Printing	✓	
Poster Printing	✓	
Direct Print Submission Functionality	=	=
Ink Consumption	✓	
Device Feature Set	✓	
Print Driver Feature Set	✓	

Test Objective

Keypoint Intelligence was commissioned by Canon Europe to conduct confidential document imaging device performance testing on the 36-inch Canon imagePROGRAF TX-3100 and the HP DesignJet T1600dr, 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 Keypoint Intelligence's European test facility in Wokingham, UK.

Executive Summary

In Keypoint Intelligence's rigorous wide format evaluation, the Canon imagePROGRAF TX-3100 outclassed the HP DesignJet T1600dr in many areas, with higher productivity, lower ink consumption, and superb colour and black image quality. While the HP model had faster throughput and dual jobstream speeds in Fast mode, the Canon TX-3100 was superior in all other tests. It also has a design advantage (hot swap ink tanks) that boosts productivity, which is not available on the HP T1600dr. Longer workflows are aided by high-capacity stackers on both models. While we preferred the neatness of the

JUNE 2021

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

HP's stacker and its auto sensor that pauses operation and alerts users when the stacker is full, the Canon's stacker performed well enough. The Canon's roll system has an added advantage of acting as an auto media take up unit, 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. Print quality from both models will easily satisfy the expectations of architectural, engineering, CAD, and GIS customers. However, there were clear differences in certain areas with the Canon TX-3100 delivering brighter colours, better depth of field and natural, warm skin tones, as well sharper and cleaner text and fine lines, overall. It also produced the larger colour gamut on both plain and matte coated media. The HP T1600dr produced truer neutral grays aided by the inclusion of grey in its ink set. Both devices provide additional flexibility with direct job submission utilities, of which Canon's has been newly enhanced to boost user friendly operation. The Canon TX-3100 offers further benefits including unidirectional print mode that eliminates banding even in Fast mode, borderless printing, and flexible nesting to save on paper (which is also offered on the HP unit but without the same flexibility and control over image placement).

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

Image Quality

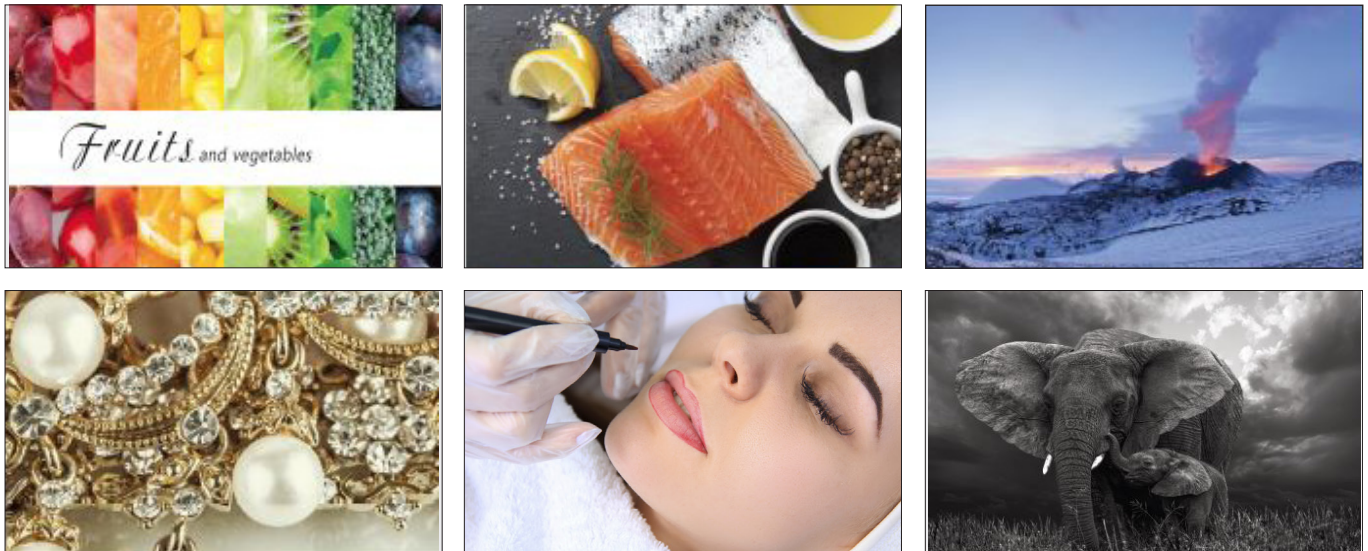| Advantage ✓	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Text	✓	
Fine Lines	✓	
Halftone Range	=	=
Halftone Fill	=	=
Solid Density	✓	
AEC Graphics	✓	
GIS Graphics	=	=
Colour Photographic Images	✓	
Monochrome Photographic Images		✓
Colour Gamut (Plain Paper, Fast)	✓	
Colour Gamut (Plain Paper, Standard/Normal)	✓	
Colour Gamut (Plain Paper, High/Best Quality)	✓	
Colour Gamut (Matte Coated Paper, High/Best Quality)	✓	

+, –, and O represent positive, negative and neutral attributes, respectively.
All image quality testing was conducted on Canon Standard Plain Paper 2 and HP Universal Bond.

+ The Canon TX-3100 delivered superior black optical densities on plain paper in Standard/Normal and High/Best quality modes compared to the HP unit, while results were comparable in Fast mode. The Canon unit produced higher colour densities in all modes as well.

+ When printing on plain media in Fast mode, the Canon TX-3100 delivered a 79.9% larger colour gamut, with a volume of 181,704 versus a volume of 101,018 for the HP model.

+ The Canon device produced a 102.7% larger colour gamut when printing on plain paper using Standard/Normal settings (with a volume of 297,079 versus a volume of 146,581 for the HP model).

+ On plain paper in High/Best settings, the Canon TX-3100 produced a 96.3% larger colour gamut, with a volume of 299,270 versus a volume of 152,492 for the HP model.

+ When printing on matte coated paper in highest quality settings, the Canon model delivered a 7.6% larger colour gamut than that of the HP T1600dr, with a volume of 398,348 compared with 370,075 for the HP unit.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

+ The Canon TX-3100 delivered very good colour text, which was legible and fully formed down to the 3-pt. level, while black text was distinct and excellent in all tested modes. The HP T1600dr produced colour and black text that was legible at the 3-pt. level in Fast, and 4-pt. level in Normal mode and only rated good due to some ink bleed marring definition; in Best mode, text was bold and distinct at the 3-pt. level with no bleed, and rated very good.

+ Fine lines produced by both devices were distinct at the 0.1-pt. level across all modes. The TX-3100's output was slender and clean, and judged very good in Fast and excellent in Standard and High quality modes. The HP T1600dr produced dark fine lines that were less smooth in Fast mode, and while they were much smoother and rated very good in Normal and Best quality modes, 0.1-pt. lines appeared as bold as the 0.25-pt lines.

+ Circles produced by the Canon unit were smooth and distinct and judged very good at the 0.1-pt. level in Fast, and excellent in Standard and High quality mode. The HP T1600dr produced bold circles at the 0.1-pt. level which weren't distinguishable from 0.25-pt. circles in Fast mode and were slightly jagged in Fast and Normal modes; in Best quality mode, circles were much smoother and rated very good

+ The Canon TX-3100 produced very good 1x1 pixel grids in CMYK in all modes, with consistent coverage and uniform dots. While the HP model delivered intact 1x1 grids in CMY, dot formation was poor in Fast mode though more distinct and well-formed in Normal and Best quality modes; in black mode, the HP produced a full 2x2 grid in Fast mode and 1x1 pixel grid in Normal and Best mode, all with slightly inconsistent dot shapes.

O Both devices delivered very good, consistently smooth colour and greyscale halftone output across the full range—from the 10% to 100% dot-fill levels—in all modes with distinct transitions between all levels.

+ Architectural, Engineering and Construction (AEC) graphics output from both devices exhibited an excellent level of detail in all modes. In Fast and Standard/Normal modes the Canon TX-3100 had a slight edge over the HP unit for its crisper text and cleaner lines when viewed under magnification, while HP's output was bolder and displayed slight ink bleed, but only when viewed under magnification. In High/Best quality mode, both models produced comparable quality.

O Geographic Information Systems (GIS) graphics in Standard/Normal and High/Best modes on plain paper were reproduced to a very high standard on both units, with excellent detailing and depth of field—a critical factor in delivering a realistic three-dimensional rendering of topographical features.

+ The Canon TX-3100 produced very good colour halftone images overall. Colours were consistently bright and natural looking, metallics exhibited good contrast and detailing and it delivered greater depth of field in all tested modes. In contrast, images produced on the HP T1600dr lacked vibrancy and appeared flat in all modes, while tonal gradations were slightly grainy in Fast and Normal mode.

- Both models produced smooth greyscale images in Standard/Normal and High/Best modes, exhibiting excellent detailing in light contrast areas. Output from the Canon TX-3100 exhibited sepia tones however, while the HP T1600dr delivered truer neutral grey tones, ultimately giving it the edge.

+ Skin tones produced by the Canon TX-3100 were warm and natural-looking in all tested modes, whereas those produced by the HP model were slightly magenta in Fast, and pale and lacked contrast in Normal and Best quality modes.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

+ Image quality output from the Canon TX-3100 was judged stronger by Keypoint Intelligence technicians on account of the crisp and distinct text and fine lines, bright colours, and natural-looking skin tones. It also produced larger colour gamuts and higher optical densities. The HP unit produced excellent truer neutral greys, its output on plain paper suffered from slight ink bleed (under magnification) and it could not match the Canon's bright and vibrant colours in photographic images.

Keypoint Intelligence's colour and greyscale halftone test targets

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Print Productivity

Advantage ✓	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
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		✓
A0 Throughput Speed (Default mode)	✓	

+   After a weekend of non-use, the Canon TX-3100's first page out time was 17.7% faster than the HP model's (128.00 seconds versus 155.61 seconds for the HP T1600dr). Start-up time before printing commenced was also faster for the Canon model at 55.40 seconds, compared with 92.50 seconds for the HP unit.

+   The Canon device delivered a fractionally faster (by 4.3%) first-page-out time of 90.53 seconds from its ready state, compared with 94.60 seconds for the HP T1600dr. Its start-up time before printing commenced was faster, too—18.00 seconds compared with 30.06 seconds for the HP model.

-     When printing Keypoint Intelligence's job stream, designed to simulate a typical mixed workflow for a large-format unit, the Canon TX-3100 was 14.5% slower than the HP model in Fast mode.

+   However, in Standard/Normal mode the Canon was 50.7% faster, and again 47.5% faster in High/Best mode.

-     As both models offer a dual-roll design, KPI 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-3100 completed the dual-roll job stream in Fast mode in 744.03 seconds—15.1% slower than that of the HP T1600dr model (646.24 seconds).

+   When printing the 12-page DWF test file in colour, the Canon TX-3100 was faster than the HP unit in two of the three modes tested; it was 7.6% slower in Fast mode; 33.9% faster in Standard/Normal mode; and 49.8% faster in High/Best mode.

+   Similarly, when printing KPI's 12-page DWF test file in monochrome, the Canon model was 7.4% slower in Fast mode; 34.0% faster in Standard/Normal mode and 49.4% faster in High/Best mode than the HP device.

+   When printing KPI's single-page A0-size test target in Standard/Normal mode, the Canon TX-3100's first-page-out time of 84.03 seconds was 39.7% faster than that of the HP unit (139.32 seconds). The time to print five A0-size pages was 34.2% faster for the Canon TX-3100 than for the HP device (427.66 seconds versus 649.52 seconds).

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

\+ When the unit runs out of paper, the Canon TX-3100 pauses and alerts the operator. After a new roll is installed, it resumes printing at the start 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. In contrast, the HP T1600dr will resume printing the rest of the interrupted page after a new roll is installed and therefore the page must be reprinted in its entirety.

Banner Printing

Advantage ✓	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Image Quality	=	=
Productivity	✓	

\+ The Canon TX-3100 successfully printed Keypoint Intelligence's 36" x 105" banner (a 4,955-KB PDF file) in Fast mode, taking 5.96 seconds to generate a preview at the desktop, and an additional one minute, 51.21 seconds from preview to final paper cut. The HP T1600dr took 15.08 seconds to create a preview and it was slightly slower than the Canon unit, printing the banner in full in a time of one minute, 59.26 seconds. Both models printed the entire image without any quality issues.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

Poster Printing

Advantage ✓	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Image Quality	✓	
Productivity (Fast mode)	✓	
Productivity (Standard/Normal mode)	✓	
Productivity (High/Best Quality mode)	✓	

+ When printing KPI's A1-sized Poster test target in Fast mode at 300 dpi, the Canon TX-3100 took 20.84 seconds to complete the job, while the HP T1600dr took 22.15 seconds.

+ Banding was 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). When unidirectional printing was selected in the Canon print driver, banding was eliminated with an increased print time of 37.67 seconds.

+ The Canon model took 39.49 seconds to print the poster in Standard mode at 600 dpi, besting the HP unit's 1 minute, 4.54 seconds in Normal mode.

+ In Standard/Normal mode, the Canon poster showed no banding, while HP's poster exhibited minimal banding in dark areas.

+ When printing the poster in High/Best mode, the Canon model took 1 minute, 20.27 seconds, 51.4% faster than the HP unit's 2 minutes, 45.21 seconds result when printing in Best mode.

O As expected at the High/Best Quality settings, there was no observable banding on output from both models.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Direct Print Submission Functionality

Advantage ✓	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Direct Print Submission Functionality	=	=
Mobile App Integration	=	=

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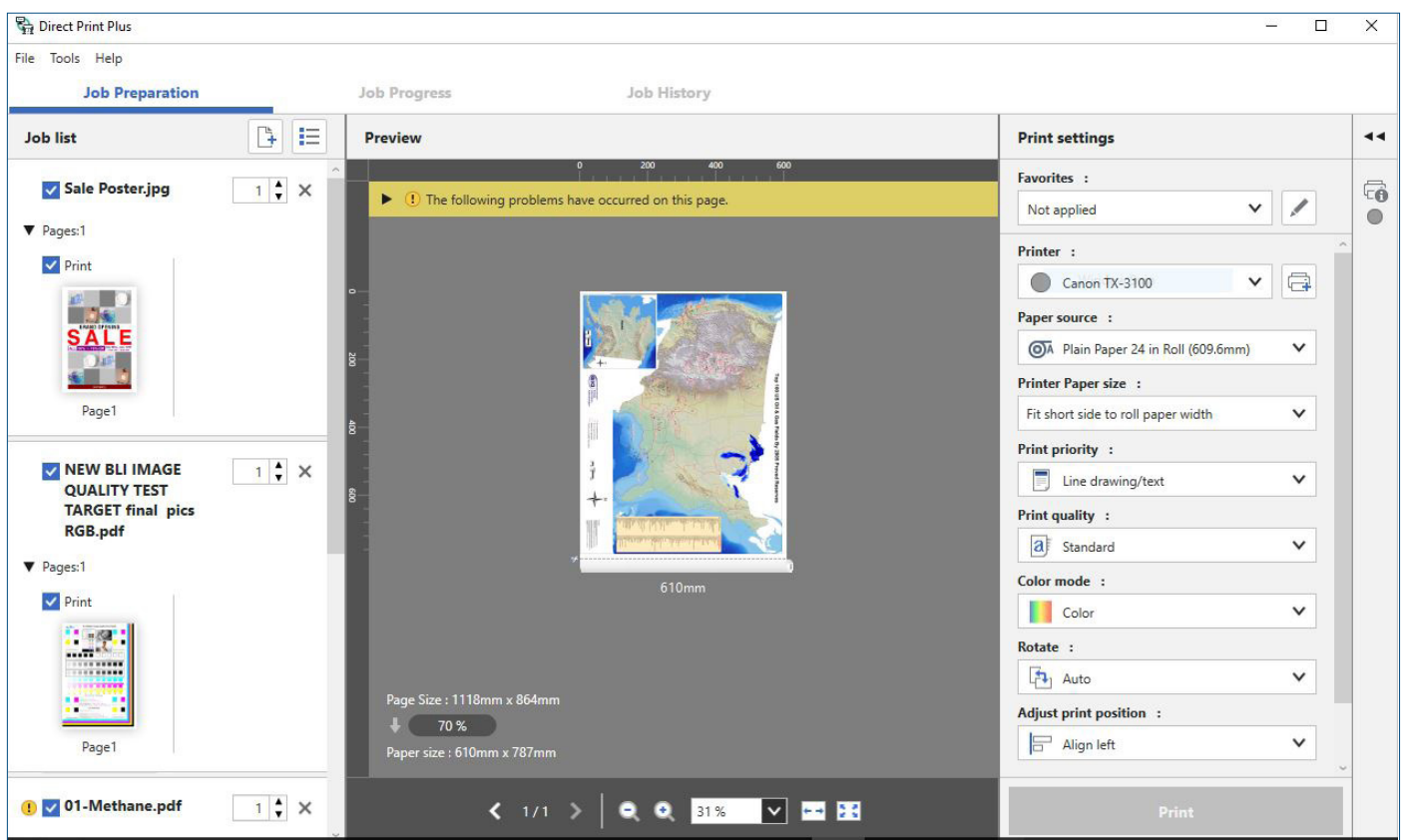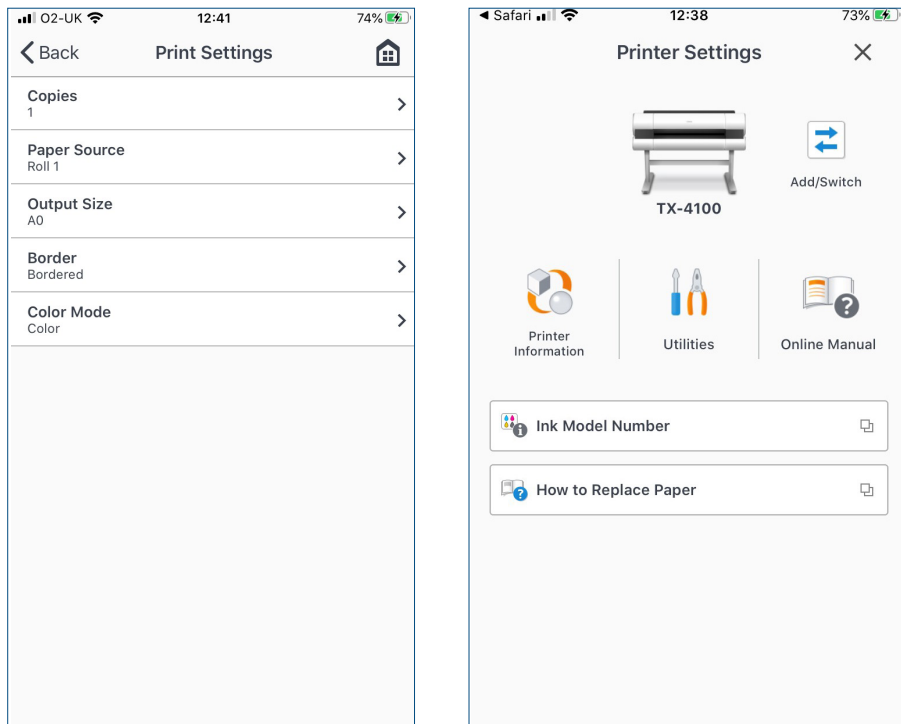

Direct Print Plus job submission software enables the direct printing of PDF, JPEG, TIFF, and HPGL/2 files without the need for native applications or print drivers. From the Job History tab, users can prints jobs selected from the print history log again using the same settings as when last printed.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

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

O   The Canon TX large format series supports Canon PRINT, a free-to-download mobile print app for Android and iOS users. It provides an easy way to print wirelessly to the Canon imagePROGRAF TX-3100 on the same WiFi network, which boosts both productivity and flexibility. The Canon PRINT app offers a basic range of print settings, including colour, orientation, and borderless printing and is very straightforward to use. Users can also view printer status and remaining ink levels as well as carry out some maintenance tasks remotely.
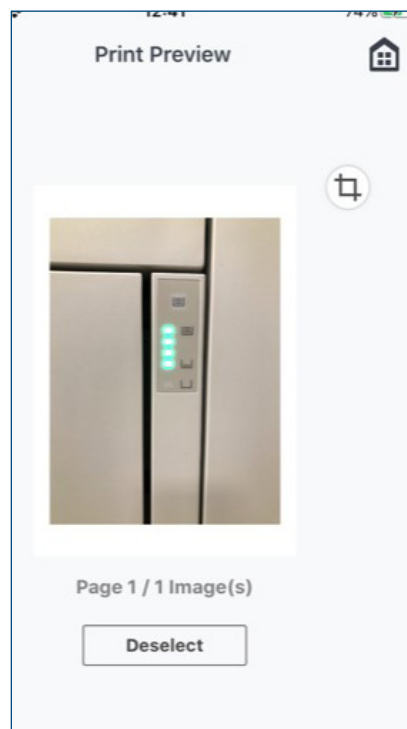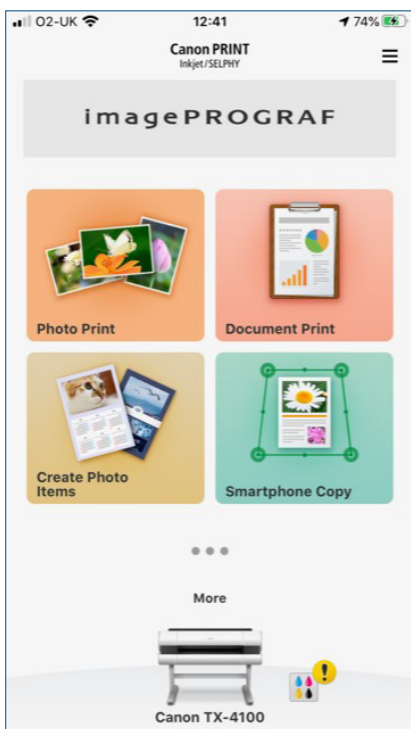

The Canon PRINT App home screen (left); Print Preview screen (centre); Edit Image (Rotate and Crop) screen (right)

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

The Canon PRINT App's available print settings (left); Printer status information and online help (right)

O   HP's own direct job submission software, HP Click, is free to download and provides direct printing of PDF, JPEG, TIFF, and HPGL/2 files from the PC desktop, without the need for native applications or print drivers. Users are able to select print settings such as colour mode, quality setting, nesting, resize and align image, as well as preview the job file in the centre of the screen.

O   In addition, the HP DesignJet T1600dr supports HP ePrint functionality, whereby users can 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.

CUSTOM TEST REPORT

**Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr**
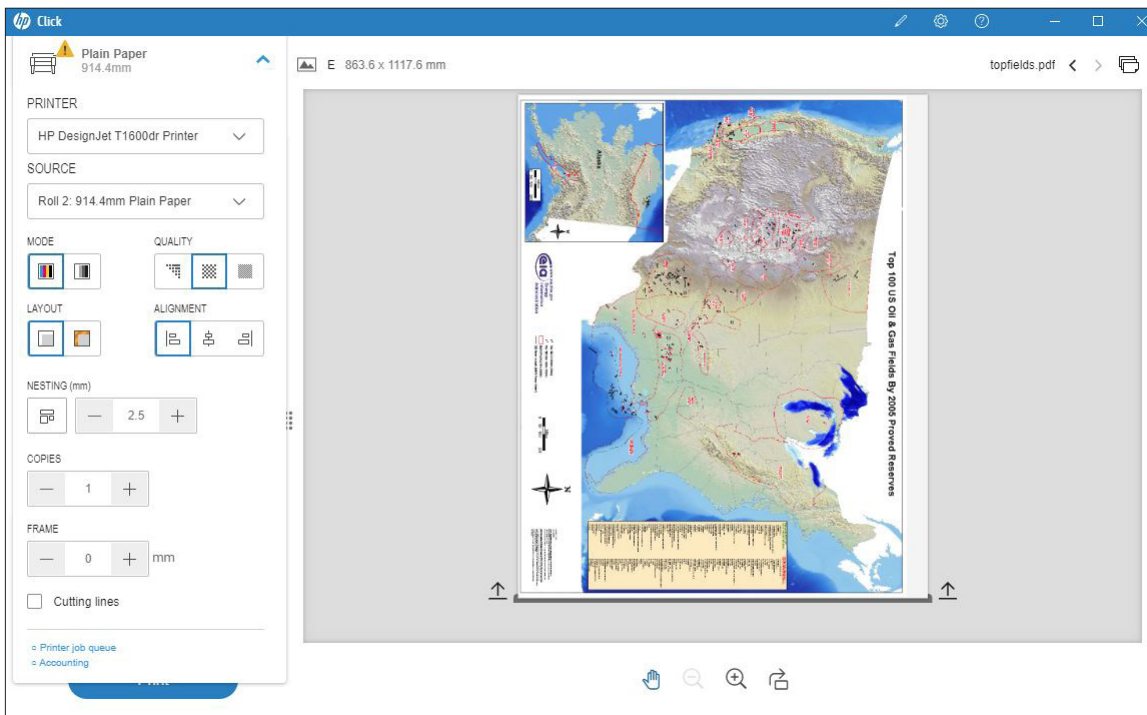
Similar to Canon's utility, HP Click lets users view job history and the status of current jobs in progress via the pages graphic at the top right of the screen. Printer information and consumable status can be obtained by clicking the 'Accounting' link on the bottom left of the screen, which launches the device's embedded web utility.
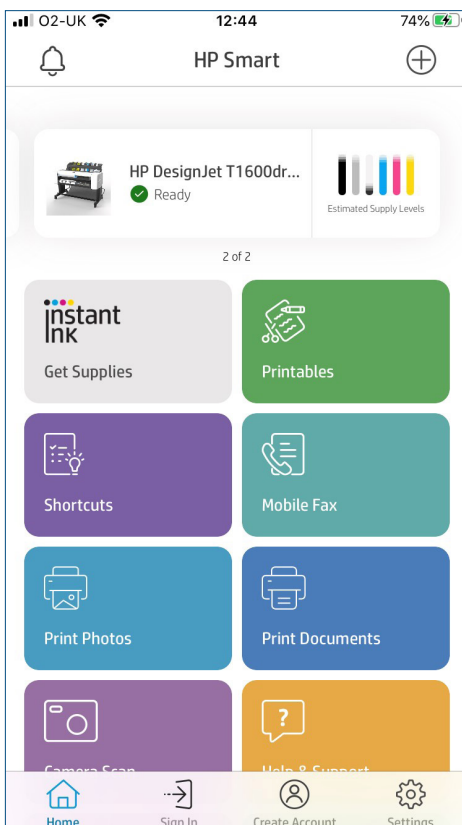
The HP Smart app provides an easy way for users print to the T1600dr from their Apple iOS and Android smartphones and tablets. Other features include the ability to scan documents directly to their mobile device; retrieve, print, or upload files to a variety of cloud storage services such as Dropbox, Box, Google Drive and Evernote; and, monitor printer status. Document editing options are available through the Preview function.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Ink Consumption
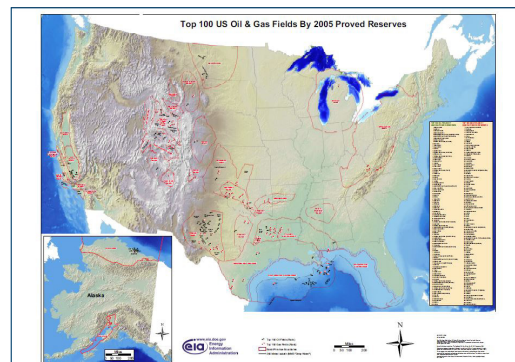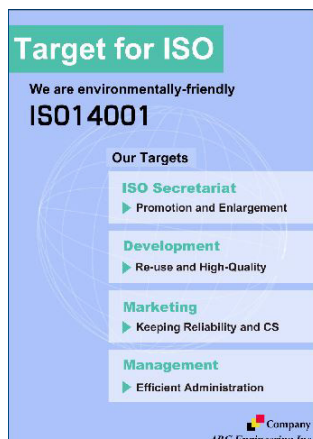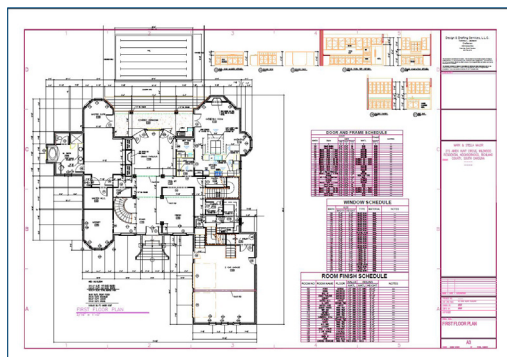
Cottage Architectural Plan

ISO Office Poster

GIS Map

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

Overall Weight of Ink Used (in Grams)

	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Cottage Architectural Plan	46.8	36.8
ISO Office Poster	93.1	125.1
GIS Map	86.1	114.8

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

- The Canon TX-3100 device used 27.2% more ink than the HP T1600dr when printing a Cottage Architectural Plan test target in Standard/Normal Mode. For the same print scenario, the Canon TX-3100 used 1.3% of its total available ink, while the HP model used 2.1%.

+ When printing the ISO Poster in Standard/Normal mode on matte coated media, the Canon unit used 25.6% less ink compared with the HP device. For the same print scenario, the Canon TX-3100 used 2.5% of its total available ink, while the HP model used 7.2%.

+ In the GIS Map ink consumption test conducted in Standard/Normal Mode using matte coated media, the Canon TX-3100 used 25.0% less ink compared with the HP device. For the same print scenario, the Canon TX-3100 used 2.3% of its total available ink, while the HP model used 6.6%.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Device Feature Set

+   The 970ml total starter cartridge capacity for the Canon TX-3100 is far higher than the 240 ml total starter ink volume available with the HP T1600dr. Canon offers 160 ml, 330 ml, and 700 ml capacity cartridges for all colours whereas the HP model provides 130 ml and 300 ml for all colours and, consequently, they will need replacing more frequently than with the Canon device.

+   Canon's ink cartridges are replaceable during operation, which helps reduce downtime for Canon users. HP's cartridges cannot be replaced during operation.

O   Both units utilize a single user-replaceable printhead, which take under five minutes to replace on each model.

O   Both also provide easy and quick roll paper loading with auto paper feed. Canon's Intelligent Media Handling feature allows the user to simply slide in the media from the front of the printer with ease. The printer automatically detects media type, width, and length, for simplified user handling. Similarly, once the user loads paper on to the HP device, alignment and width adjustments are automatically carried out without further user intervention.

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.

O   The Canon TX-3100 offers media loading options at the front, although the stacker (if attached) will need to be removed first in order to gain access to the rolls. The HP device allows media rolls to be loaded from the top rear and back of the device. Users are advised to leave enough space around the unit when positioned close to a wall, so to avoid paper advance issues (some models come with wall spacers which can be lowered to ensure a minimum distance).

O   Both printers offer paper tracking capabilities that, when enabled, will print media information in text and a barcode, with remaining roll length and type of paper on the partially-used roll's edge before its removal from the device.

+   The Canon TX-3100 supports borderless printing regardless of what roll media type is being used, whilst the HP model does not support this feature.

+   The Canon device supports a maximum 1.6 m printable cut sheet media length versus 1.219 m for the HP unit.

+   The Canon TX-3100 supports up to 0.8 mm media thickness and handles 170 mm as the outside diameter for roll paper, compared to 0.5 mm and handles 135 mm in diameter for the HP T1600dr.

+   The TX-3100's optional Multifunction Roll System can also act as an auto Take-up-Roll unit with bi-directional rewind. Keypoint Intelligence technicians noted this could be an extremely valuable feature in high-volume production environments, enabling large numbers of prints to be stored on a single roll. This option is not available for the HP device.

O   Both models come with a simple catch bin/basket to collect output from media rolls. Canon's catch basket can be arranged in different positions to suit the type of paper and quantity being produced, and whether the roll unit is employed.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

O   The Canon TX-3100 can be configured with a high-capacity stacker, capable of collating up to 100 A0-sized CAD prints for increased productivity; this feature is matched on the HP T1600dr.

-    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 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.

Keypoint Intelligence technicians noted the Canon TX-3100's stacker assembly at the front of the device held printed A0 and A1 sheets in good, neat alignment. While the stacker was capable of stacking up to 100 A1 and A0 sheets in one go, there were occasions during testing where it fell short, especially when approaching the end of the media roll. Consequently, a higher number of sheets would stack better and more neatly when a new roll was in use.

The rear mounted stacker on the HP T1600dr held printed sheets in perfect alignment. A1 printouts hang over the edge but as they are held firmly in place, there were no issues experienced.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
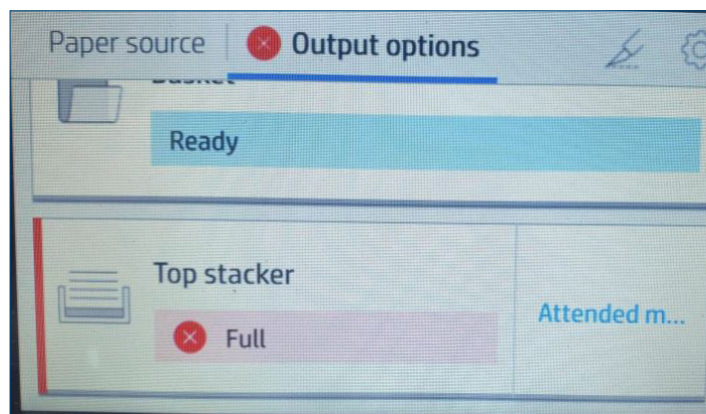
Notably, the HP unit's stacker has a built-in paper sensor, which detects when the stacker capacity threshold has been reached. The device subsequently stops printing to allow the operator to remove printouts before resuming the job automatically. Conversely, the Canon TX-3100 will continue to print 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.

O   A media mismatch option on the Canon unit places jobs that can't be printed due to the required media not being loaded on hold. Jobs that can be completed will automatically print while the queued jobs are printed as soon as the required paper is loaded. The HP embedded web page's "Paper mismatch action" lists three options on how to handle a media mismatch: hold the job in question and continue with printing the next that can be completed without delay; print the job anyway; or enable a warning directly in the print driver to users before the job is submitted, with a control panel warning appearing after it is submitted. The HP control panel allows users either to put the job on hold (and continue printing any job that's slated to use the paper already loaded on the device) or print it.

-    The Canon model offers a standard, non-upgradable (virtual) RAM capacity of 128 GB (2 GB physical RAM), while the HP unit has a standard non-upgradable (virtual) RAM capacity of 128 GB (based on 4 GB DDR3 RAM).

O   A standard 500-GB encrypted hard drive is built in to both devices, which allows for the storage of documents that are frequently required and aids spooling workflow.

O   The Canon TX-3100 comes with robust security features, including secure disk erase hard drive encryption and protocol locking to prevent unauthorised access to the device; it also supports SNMP v3 (secure network protocol) and IPsec which provide further security by authenticating and encrypting data over the network. The HP T1600dr features a self-encrypting hard drive that is only readable by the printer itself even if removed from the device. For additional device security, HP Secure Boot ensures BIOS protection, while the Whitelisting feature allows only approved firmware to be installed and run on the device; the model is also compatible with HP JetAdvantage Security Manager to further safeguard use.

-    The HP model is much lighter with a net weight of 85 kg versus 105 kg for the Canon unit.

O   Both models offer a colour touchscreen user interface, which are similarly responsive and intuitive to navigate.

-    The Canon TX-3100's power consumption while active is a little higher—115 watts versus 100 watts—than that of the HP model.

-    Rated noise emissions are higher for the Canon model (51 dB) compared to the HP device (42 dB) while the devices are printing, and slightly higher again when in standby mode (35 dB versus 32 dB).

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Driver Feature Set

O   The Canon TX-3100 has five speed settings (Fast 300, Standard 600, Fast 600, High 600 and High 1200), which are matched by similar settings on the HP device (Economode 300, Fast 600, Normal 600, Best 600 and 1200), although not all speed settings are available with all media types on each.

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 five.

+   There are various features offered by the Canon driver which aren't supported on the HP driver, including multi-up (2 to 16) printing, poster printing (2 by 2), and page stamping.

O   The Canon imagePROGRAF Printer Driver offers a broad range of built-in adjustments for CMY balance, brightness and contrast, while the HP T1600dr's HPGL/2 driver also offers CMY balance and brightness adjustments. The Canon driver's advanced colour-matching selections include the ability to match ICC profiles and select the rendering intent based on different elements in the document.

-       The HP driver provides a handy thumbnail preview for users to check the effects on the image as they make colour adjustments, which is not available in the Canon driver.

+   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.

+   Both 64-bit and 32-bit versions of the Canon driver now include the Color imageRUNNER Enlargement Copy Mode utility. This enables users to integrate a Canon small-format MFP device with the TX-3100, whereby documents scanned at the MFP are automatically routed to a hot folder that is monitored by the TX-3100 driver. The image is then resized and printed, offering a fast, easy-to-use poster creation tool for office users. There is no equivalent functionality in the HP driver.

+   Canon's Free Layout plus software 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, or when using HP Click. However, unlike the Canon tool, users don't have the same precise control over the positioning of jobs, rather jobs are randomly positioned to print across the width of a page, either in the order they were submitted or in 'optimized' layout order.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
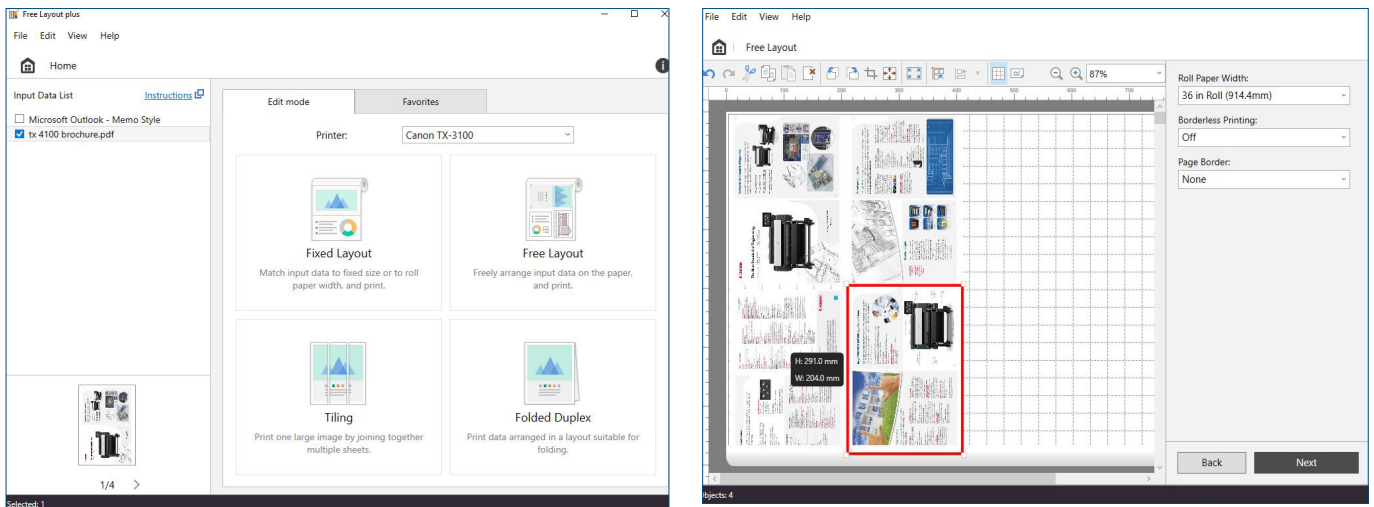
Canon's Free Layout plus enables users to arrange documents from different applications on a page so as to use paper more efficiently.

+   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. HP offers no equivalent software.

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.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Canon Accounting Manager

HP users can assign costs against paper, ink, and colour/mono work and export accounting reports as .csv files

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Test Models' Print Driver Screenshots
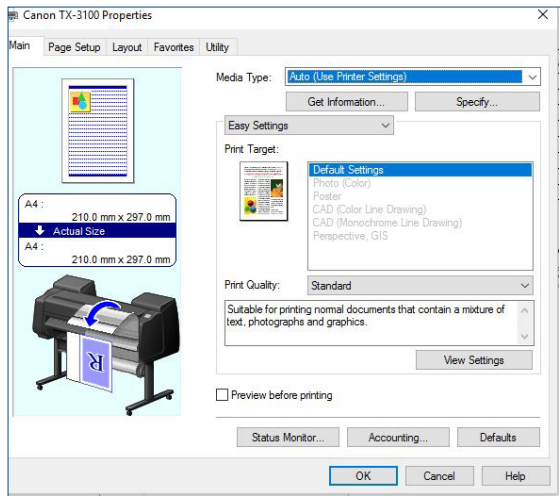
Canon imagePROGRAF TX-3100 Print Driver Main Tab
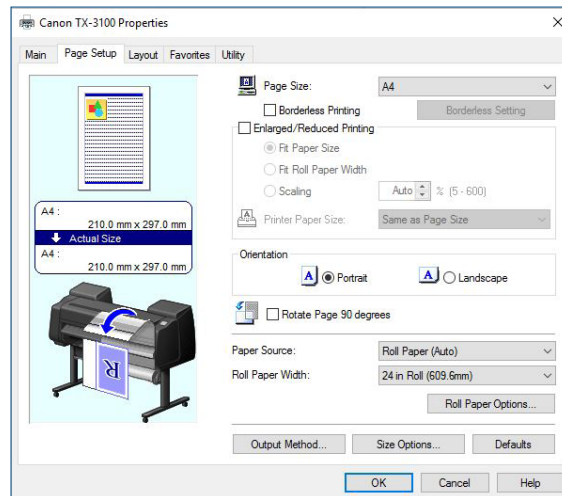
Canon imagePROGRAF TX-3100 Print Driver Page Setup Tab
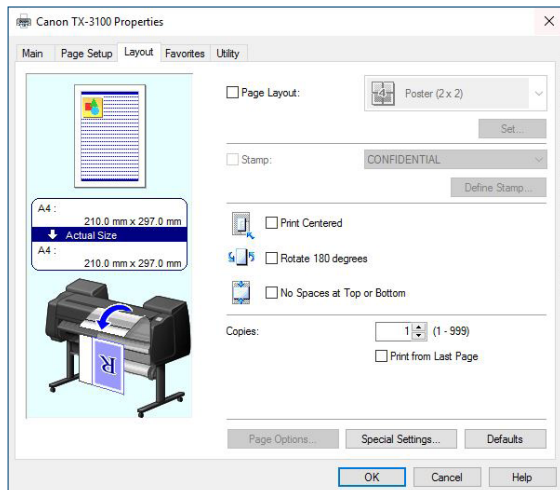
Canon imagePROGRAF TX-3100 Print Driver Layout Tab
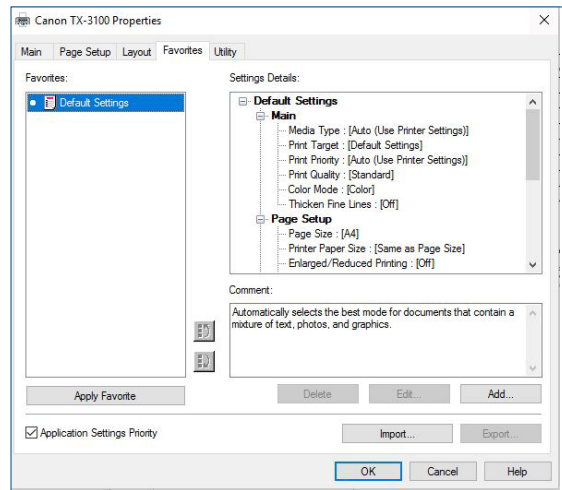
Canon imagePROGRAF TX-3100 Print Driver Favourites Tab
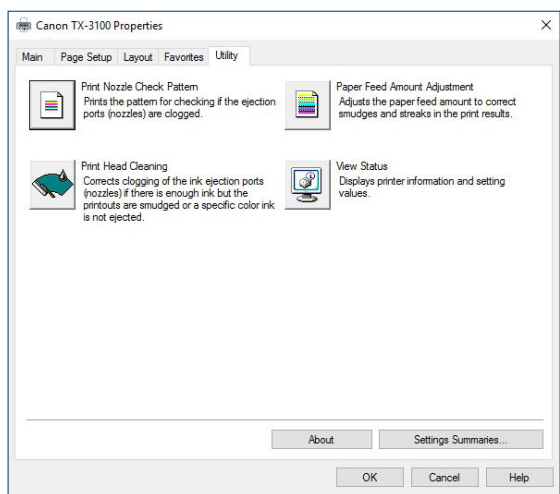
Canon imagePROGRAF TX-3100 Print Driver Utility Tab
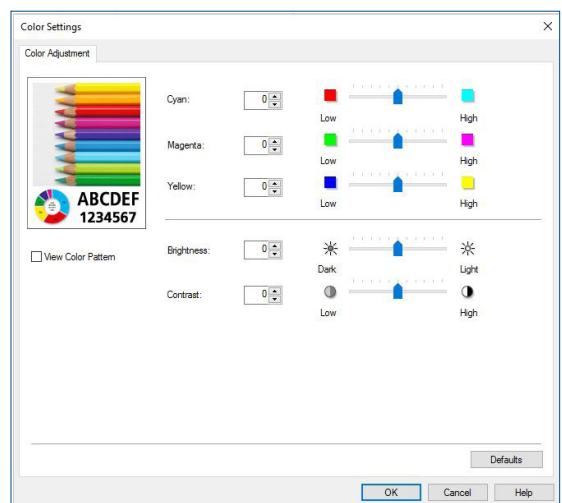
Canon imagePROGRAF TX-3100 Print Driver Colour Adjustment Tab

This report has been reproduced with the written permission of Keypoint Intelligence.

Any duplication without the written permission is prohibited ©2021 Keypoint Intelligence – (060121)

20

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
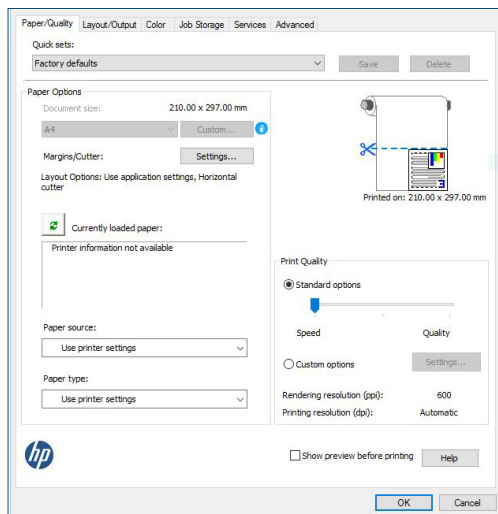
HP DesignJet T1600dr Print Driver Paper/Quality Tab
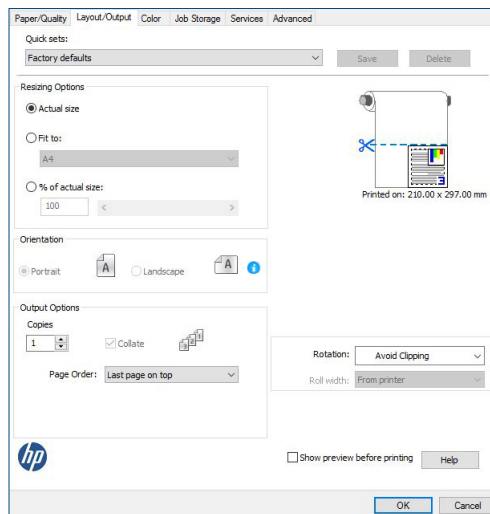
HP DesignJet T1600dr Print Driver Layout/Output Tab
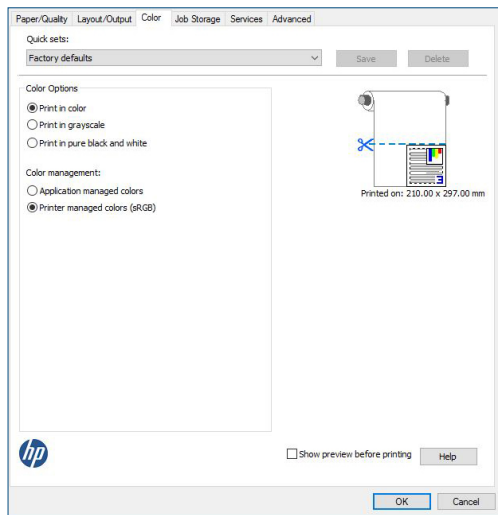
HP DesignJet T1600dr Print Driver Colour Tab
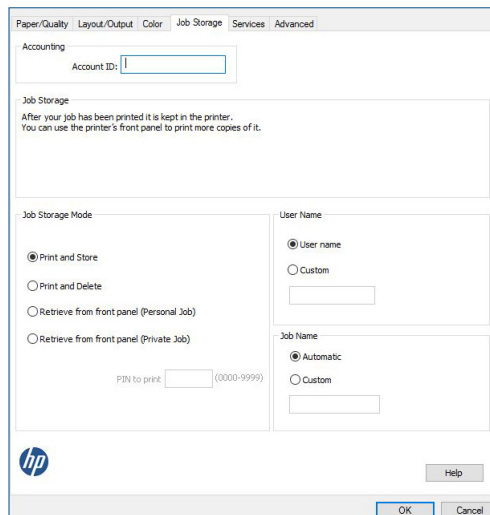
HP DesignJet T1600dr Print Driver Job Storage Tab
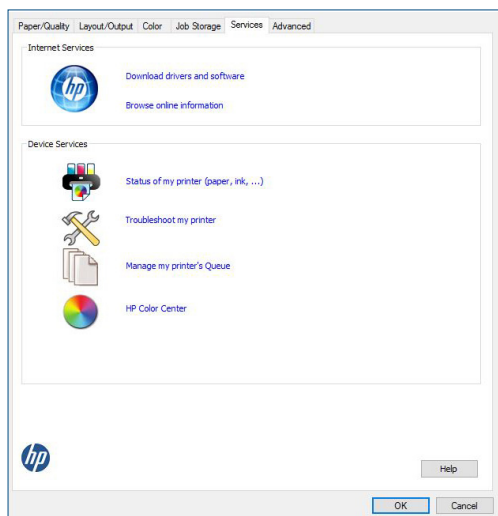
HP DesignJet T1600dr Print Driver Services Tab
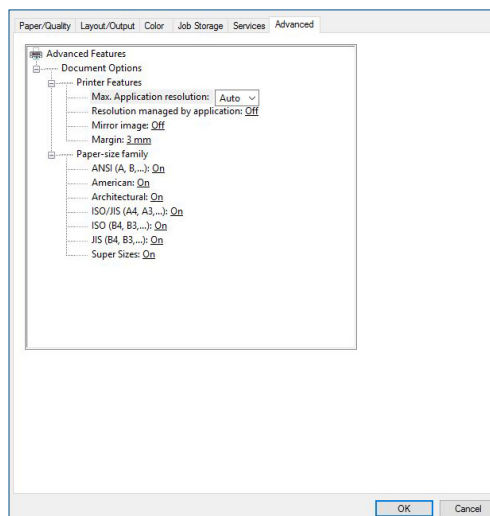
HP DesignJet T1600dr Print Driver Advanced Tab

This report has been reproduced with the written permission of Keypoint Intelligence.

Any duplication without the written permission is prohibited ©2021 Keypoint Intelligence – (060121)

21

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
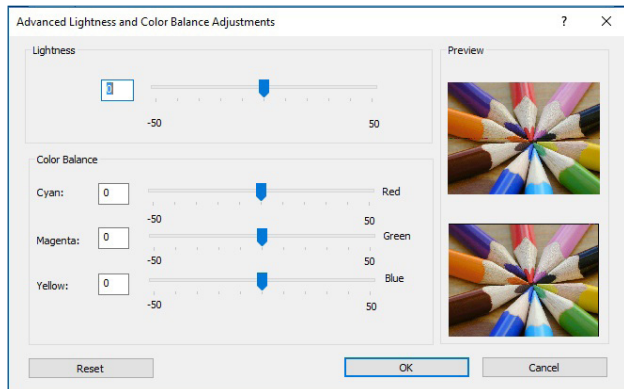
HP DesignJet T1600dr Print Driver Advanced Lightness and Colour
Balance Adjustments

SUPPORTING TEST DATA

Print Productivity

Job Stream Productivity (in Seconds)

Mixed File Types, Same Size, Single Roll

Canon imagePROGRAF TX-3100		HP DesignJet T1600dr	
Fast	513.68	Fast	448.50
Standard	882.82	Normal	1,789.33
High	1,891.42	Best	3,600.37

Keypoint Intelligence'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-3100		HP DesignJet T1600dr	
Fast	744.03	Fast	646.24

Keypoint Intelligence'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.

This report has been reproduced with the written permission of Keypoint Intelligence.

Any duplication without the written permission is prohibited ©2021 Keypoint Intelligence – (060121)

22

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Colour Productivity (in Seconds)

Canon imagePROGRAF TX-3100		HP DesignJet T1600dr	
Fast	310.10	Fast	288.11
Standard	578.24	Normal	874.35
High	1,156.23	Best	2,303.66

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-3100		HP DesignJet T1600dr	
Fast	309.34	Fast	287.97
Standard	577.59	Normal	874.93
High	1,156.30	Best	2,284.87

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-3100	HP DesignJet T1600dr
Time Before Printing Commences	55.40	92.50
First Page Out	128.00	155.61

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

	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Time Before Printing Commences	18.00	30.06
First Page Out	90.53	94.60

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.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT
INTELLIGENCE

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

	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
First Page Out	84.03	139.32
Five Pages Out	427.66	649.52

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.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Colour Print Quality

Colour Optical Density Evaluation

Canon imagePROGRAF TX-3100					
Fast		Standard		High	
50%	100%	50%	100%	50%	100%
Cyan 0.48	1.01	0.57	1.25	0.58	1.30
Magenta 0.41	0.87	0.48	1.15	0.49	1.21
Yellow 0.44	0.83	0.50	1.02	0.51	1.06
Black 0.49	1.47	0.59	1.55	0.60	1.57

HP DesignJet T1600dr					
Fast		Normal		Best	
50%	100%	50%	100%	50%	100%
Cyan 0.49	0.78	0.50	0.78	0.58	1.08
Magenta 0.44	0.76	0.44	0.76	0.44	1.03
Yellow 0.44	0.60	0.44	0.60	0.43	0.81
Black 0.36	1.33	0.36	1.32	0.54	1.46

Note: Colour density readings were assessed by printing a Keypoint Intelligence 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 Cubic L*a*b* Unit Volume Comparisons

Media Type/Settings	Canon imagePROGRAF TX-3100	HP DesignJet T1600dr
Plain Paper Fast	181,704	101,018
Plain Paper Standard/Normal	297,079	146,581
Plain Paper High/Best	299,270	152,492
Matte Coated High/Best	398,348	370,075

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Canon imagePROGRAF TX-3100 colour gamut on plain paper in Fast settings (shown chromatically) versus HP DesignJet T1600dr colour gamut (shown in red) on plain paper in Fast settings.
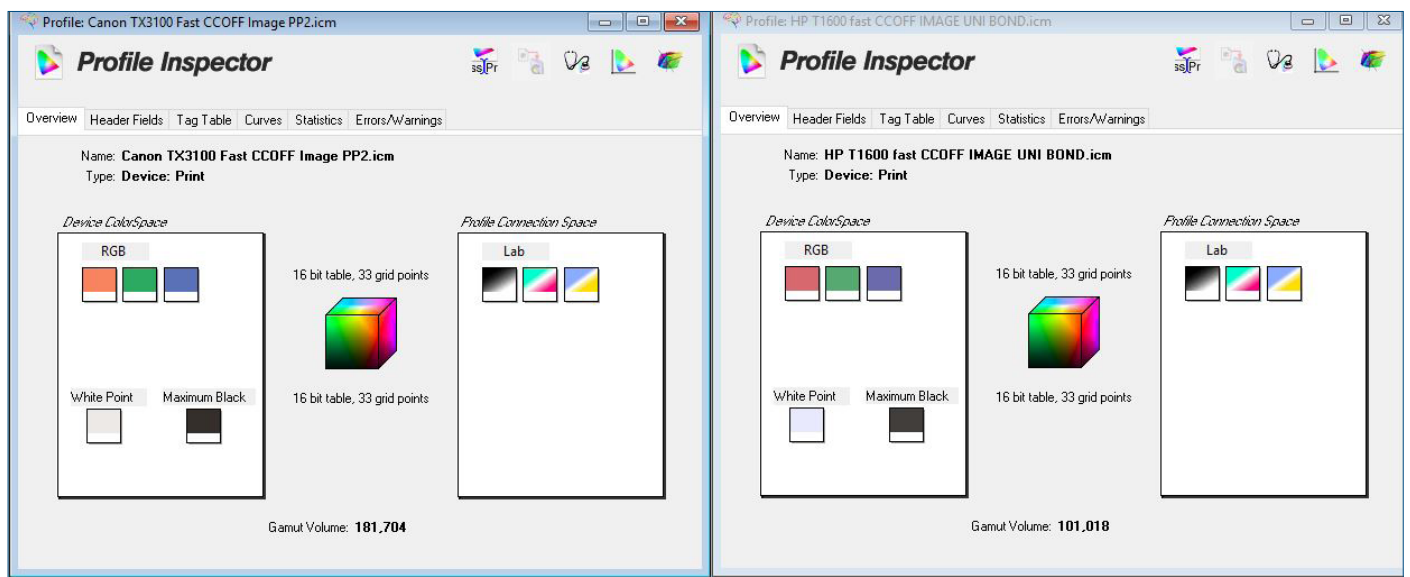
Colour gamut profile for Canon imagePROGRAF TX-3100 (left) and HP DesignJet T1600dr (right) on plain paper in Fast mode.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
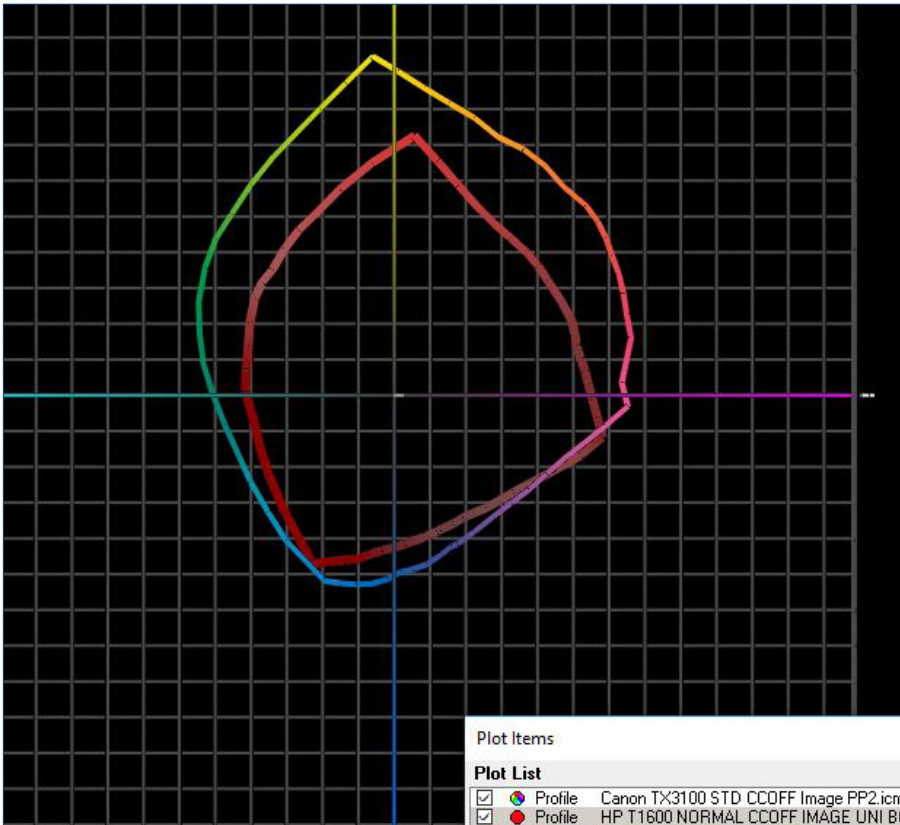
Canon imagePROGRAF TX-3100 colour gamut on plain paper in Standard settings (shown chromatically) versus HP DesignJet T1600dr colour gamut (shown in red) on plain paper in Normal settings.
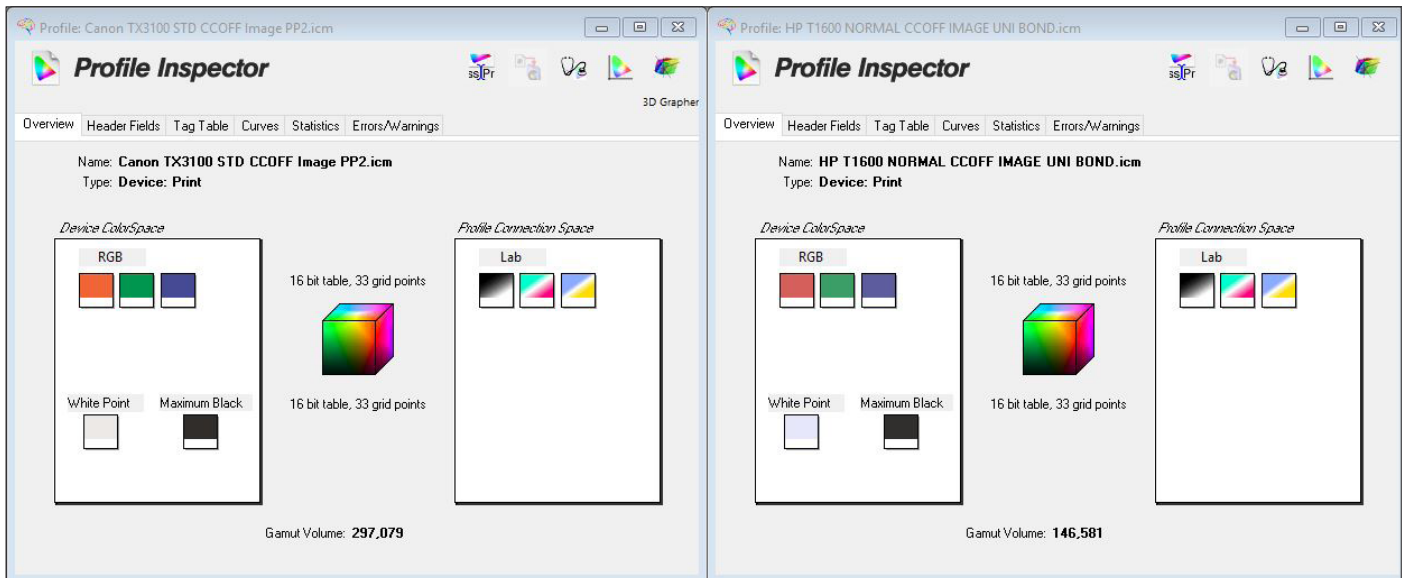
Colour gamut profile for Canon imagePROGRAF TX-3100 (left) and HP DesignJet T1600dr (right) on plain paper in Standard/Normal modes.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
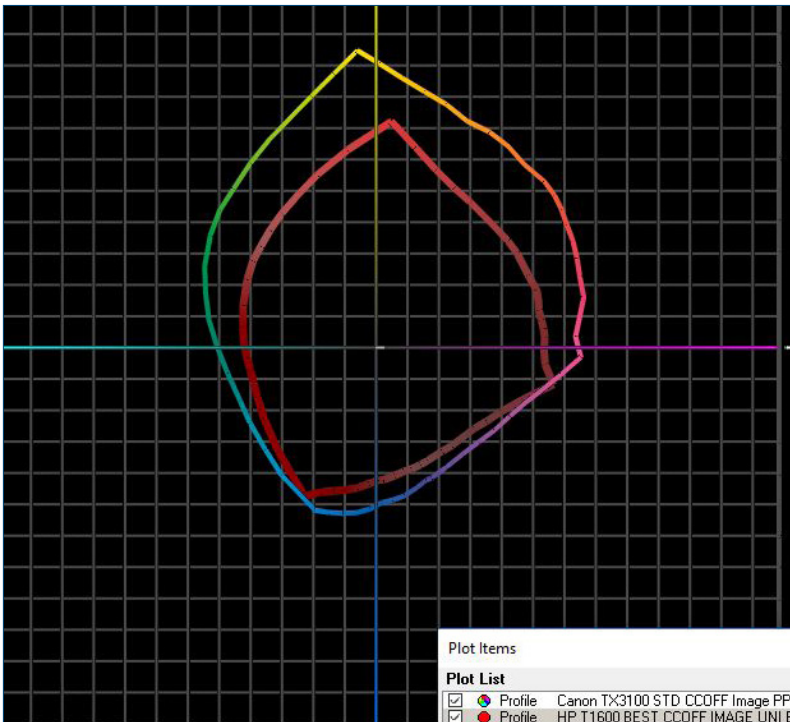
Canon imagePROGRAF TX-3100 colour gamut on plain paper in High settings (shown chromatically) versus HP DesignJet T1600dr colour gamut (shown in red) on plain paper in Best settings.
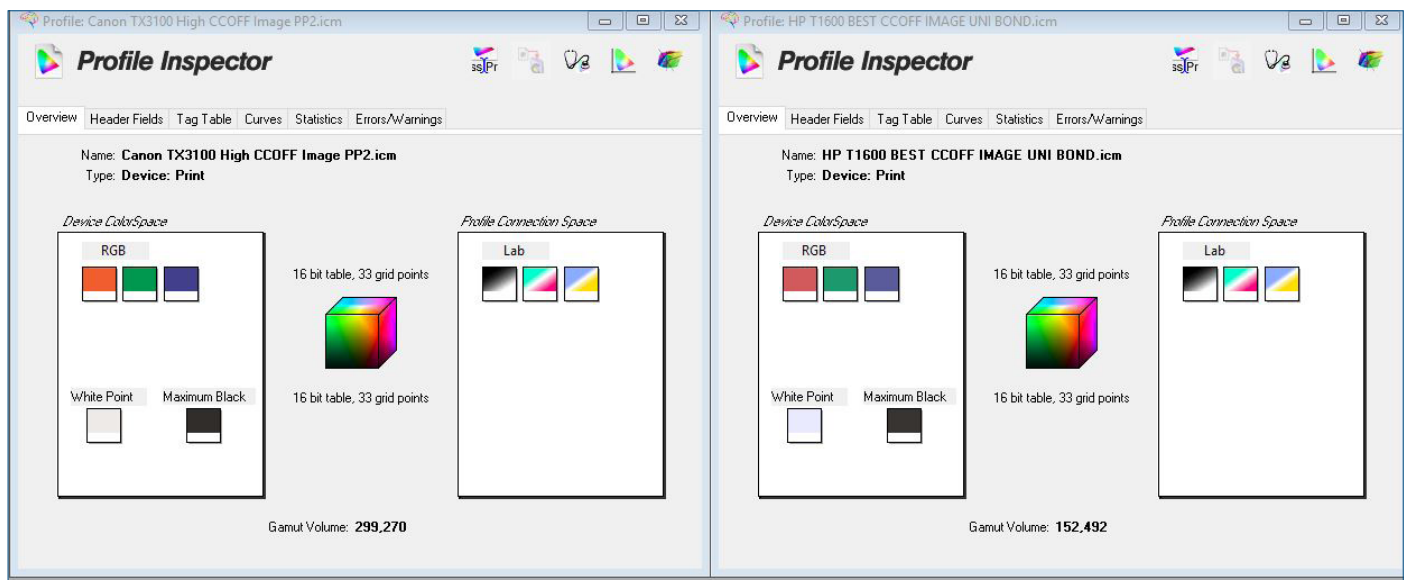
Colour gamut profile for Canon imagePROGRAF TX-3100 (left) and HP DesignJet T1600dr (right) on plain paper in High/Best Quality modes.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr
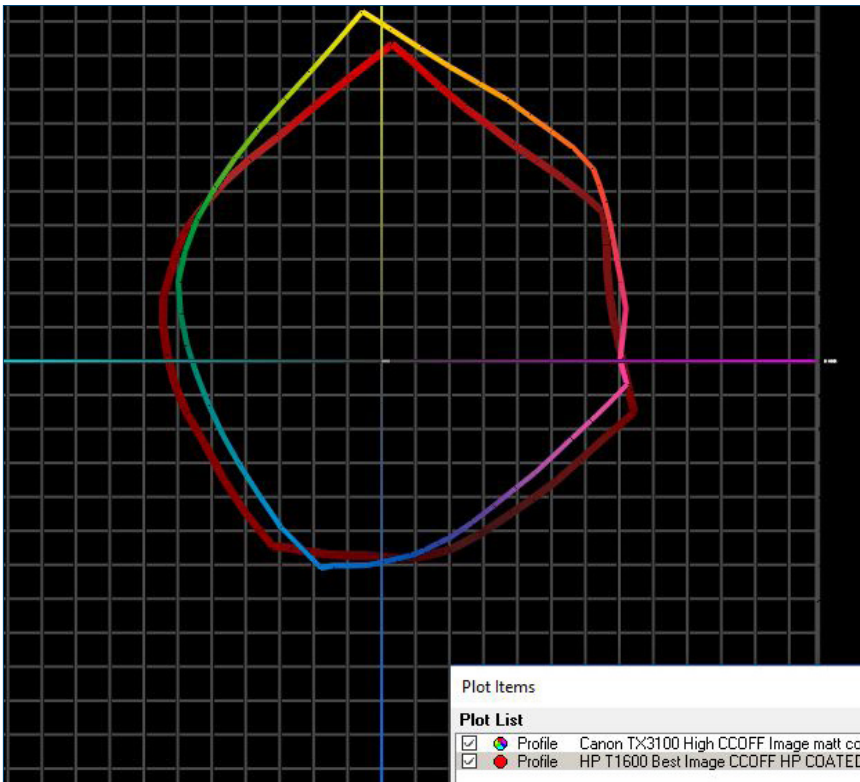
Canon imagePROGRAF TX-3100 colour gamut on matte coated paper in High quality settings (shown chromatically) versus HP DesignJet T1600dr colour gamut (shown in red) on matte coated paper in Best settings.
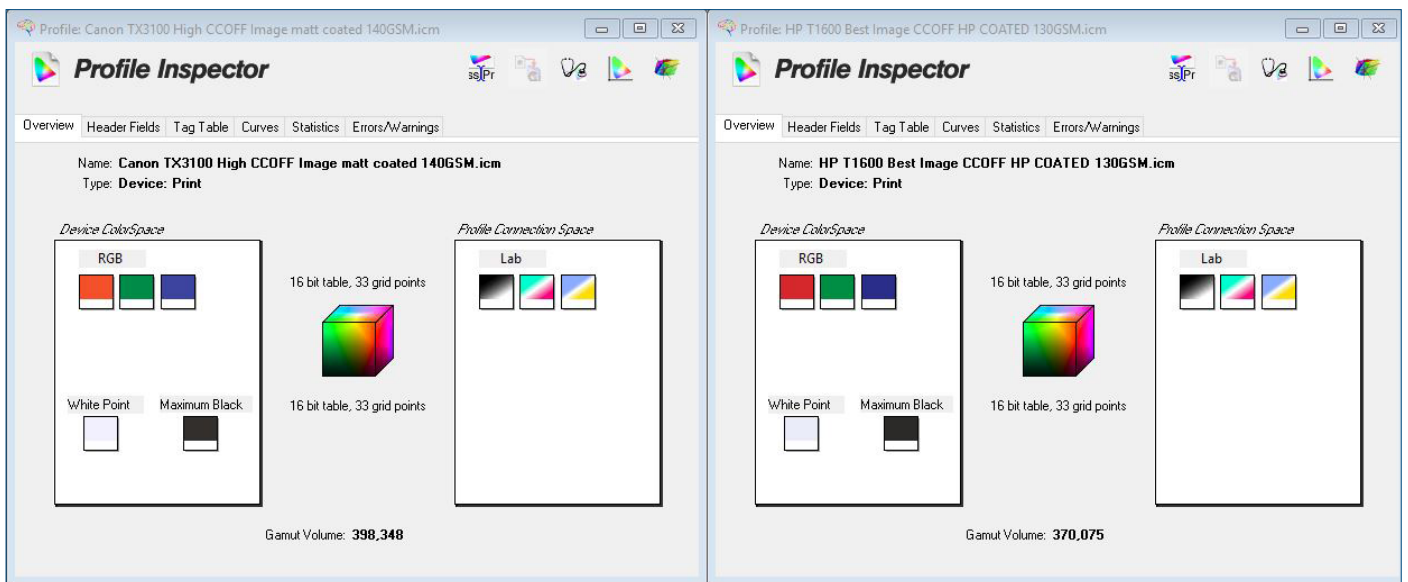
Colour gamut profile for Canon imagePROGRAF TX-3100 (left) and HP DesignJet T1600dr (right) on matte coated paper in High/Best Quality modes.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Black Print Quality

Solid Density

Density Block	Canon imagePROGRAF TX-3100			HP DesignJet T1600dr		
	Fast	Standard	High	Fast	Normal	Best
1	1.44	1.55	1.55	1.45	1.39	1.46
2	1.48	1.53	1.54	1.45	1.37	1.46
3	1.45	1.52	1.55	1.46	1.39	1.46
4	1.47	1.54	1.57	1.43	1.36	1.45

Note: Solid black density measurements are based on four readings taken from a Keypoint Intelligence 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-3100	Advantage		HP DesignJet T1600dr
Max. image resolution	2400 x 1200 dpi			2400 x 1200 dpi
Number of inks	5 (MBk, CMYK)		✓	6 (CMY, G, PBK, MBK)
Ink tanks replaceable during operation	Yes	✓		No
Ink-drop size	5 picoliter	✓		6 picoliter (CMY, 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 (all colours)	✓		130/300 ml (all colours)
Number of nozzles	MBK: 5,120 nozzles; CMYK: 2,560 nozzles each; 15,360 in total	✓		8,256 in total (1,376 per colour)
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 (Roll); 3 mm Top and Side and 20 mm Bottom (Cut sheet)			3 mm (Roll); 3 mm Top and Side and 22 mm Bottom (Cut sheet)
Borderless (0 mm) printing	Yes (Roll only)	✓		No

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

	Canon imagePROGRAF TX-3100	Advantage		HP DesignJet T1600dr
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	✓		1.219 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	Front Loading, Front Output (Roll and Cut Sheet)			Front Loading
Roll paper	Optional Multifunction Roll System (with auto media take up)	✓		Optional dual
Optional media handling	2/3 inch roll holder set			3 inch roll core adapter
High-capacity stacker assembly	100 sheets			100 sheets
Standard/Maximum RAM	128 GB (2 GB physical)		✓	128 GB (4 GB physical)
Hard drive	500 GB (Standard Encrypted)			500 GB (Standard Encrypted)
Interface	Hi-Speed USB; 10/100/1000Base-T/TX Ethernet; Wireless LAN; USB 2.0			1000Base-T Ethernet
PDL	HP-GL/2, HP RTL, PDF (Ver.1.7), JPEG (Ver. JFIF 1.02)			HP-GL/2, HP-RTL, TIFF, JPEG, CALS G4 (optional Adobe PostScript 3, Adobe PDF 1.7)
Net weight (unpacked)	105 kg (including Roll Holder Set and Roll unit, excluding ink and printhead)		✓	85 kg (includes roll unit)
Power consumption when in standby	INA			< 36 W
Power consumption when active	115 W		✓	100 W
Acoustic pressure	Operation: 51 dB (A); Standby: 35 dB (A)		✓	Operation: 42 dB (A); Standby: 32 dB (A)
Acoustic power	Operation: 6.9 Bels		✓	Operation: 5.9 Bels;

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Driver Feature Set

	Canon imagePROGRAF TX-3100	Advantage		HP DesignJet T1600dr
Speed settings	5 (Fast 300, Fast 600, Standard 600, High 600 and 1200)			5 (Economode 300, Fast 600, Normal 600, Best 600 and 1200)
Economy mode	Yes			Yes (Economode)
Predefined profiles	6 (Default, Photo colour, Poster, CAD colour line drawing, CAD mono line drawing, and Perspective, GIS)	✓		5 (Default, CAD, GIS, Photo and B/W Photo)
Overview of profile settings provided	Yes			Yes
Media profiles	56 + 10 user customizable special options	✓		36
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
Poster print mode	Yes (2 by 2)	✓		No
Page stamping	Yes (Date, Time, Name, Page Number plus the ability to add custom stamps)	✓		Not supported
Image rotation	Yes, 90 degrees and auto 180 degrees			Yes, auto rotate and 90 degrees
Option to preview before print	Yes			Yes
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-3100 comes bundled with PosterArtist Lite.

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

Ink Consumption

Table 1: Amount of Ink in Each Canon imagePROGRAF TX-3100 Cartridge (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Weight of cartridge prior to installation	953.3	947.9	941.7	955.1	938.4
Weight of cartridge at end of life	205.5	205.5	205.5	205.5	205.5
Net weight of ink	747.8	742.4	736.2	749.6	732.9
Total ink weight across five cartridges					3,708.9

Table 2: Amount of Ink in Each HP DesignJet T1600dr Cartridge (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Weight of cartridge prior to installation	390.0	396.6	394.9	401.9	404.1	403.5
Weight of cartridge at end of life	109.2	109.2	109.2	109.2	109.2	109.2
Net weight of ink	280.8	287.4	285.7	292.7	294.9	294.3
Total ink weight across six cartridges						1,735.8

Table 3: Ink Used in Three 50-Page Runs of Cottage Architectural Plan Test Document (Standard Mode) on the Canon imagePROGRAF TX-3100 (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Test Run 1 Net weight of ink used	25.3	3.5	4.2	9.4	4.2
Test Run 2 Net weight of ink used	24.1	3.4	4.3	9.5	4.7
Test Run 3 Net weight of ink used	25.5	3.7	4.7	9.3	4.5
Average amount of ink used across three runs	25.0	3.5	4.4	9.4	4.5
Total ink weight across five cartridges					46.8

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

Table 4: Ink Used in Three 50-Page Runs of Cottage Architectural Plan Test Document (Normal Mode) on the HP DesignJet T1600dr (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Test Run 1 Net weight of ink used	0.1	0.3	26.8	5.4	2.6	1.9
Test Run 2 Net weight of ink used	0.1	0.2	26.6	5.1	3.5	1.5
Test Run 3 Net weight of ink used	0.2	0.4	26.6	5.2	2.9	1.1
Average amount of ink used across three runs	0.1	0.3	26.7	5.2	3.0	1.5
Total ink weight across six cartridges for 50-page run (based on averages)						36.8

Table 5: Ink Used in Three 50-Page Runs of ISO Poster Test Document (Standard Mode) on the Canon imagePROGRAF TX-3100 (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Test Run 1 Net weight of ink used	24.4	3.7	3.6	23.2	36.0
Test Run 2 Net weight of ink used	23.3	3.5	3.4	26.1	37.9
Test Run 3 Net weight of ink used	24.2	3.0	3.9	25.2	38.0
Average amount of ink used across three runs	24.0	3.4	3.6	24.8	37.3
Total ink weight across five cartridges for 50-page run (based on averages)					93.1

Table 6: Ink Used in Three 50-Page Runs of ISO Poster Test Document (Normal Mode) on the HP DesignJet T1600dr (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Test Run 1 Net weight of ink used	10.8	3.5	16.9	59.7	24.7	7.4
Test Run 2 Net weight of ink used	11.1	3.5	16.7	60.9	26.5	8.0
Test Run 3 Net weight of ink used	10.7	3.8	17.1	60.1	25.9	7.9
Average amount of ink used across three runs	10.9	3.6	16.9	60.2	25.7	7.8
Total ink weight across six cartridges for 50-page run (based on averages)						125.1

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Table 7: Ink Used in Three 50-Page Runs of GIS Map Test Document (Standard Mode) on the Canon imagePROGRAF TX-3100 (in Grams)

	Matte Black	Black	Yellow	Magenta	Cyan
Test Run 1 Net weight of ink used	29.1	3.9	12.1	17.7	23.0
Test Run 2 Net weight of ink used	30.4	3.5	11.4	17.6	23.3
Test Run 3 Net weight of ink used	31.0	3.5	12.6	17.0	22.3
Average amount of ink used across three runs	30.2	3.6	12.0	17.4	22.9
Total ink weight across five cartridges for 50-page run (based on averages)					86.1

Table 8: Ink Used in Three 50-page Runs of GIS Map Test Document (Normal Mode) on the HP DesignJet T1600dr (in Grams)

	Photo Black	Grey	Matte Black	Cyan	Magenta	Yellow
Test Run 1 Net weight of ink used	9.3	35.1	9.2	36.2	10.1	14.3
Test Run 2 Net weight of ink used	9.0	34.9	9.7	34.3	10.8	14.1
Test Run 3 Net weight of ink used	9.8	36.1	10.0	35.4	11.2	14.8
Average amount of ink used across three runs	9.4	35.4	9.6	35.3	10.7	14.4
Total ink weight across six cartridges for 50-page run (based on averages)						114.8

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

Ink Consumption Test Methodology Overview

Keypoint Intelligence'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-3100 was installed in Keypoint Intelligence's lab with the latest "01.02" level of firmware (as of March 2021) and connected to a Windows 10 Pro 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 T1600dr was installed in Keypoint Intelligence's lab with the latest "CYCLOPSNEPTUNE_05_02_48.1" level of firmware (as of March 2021) 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, lab technicians weighed and recorded the weight of each with all packaging removed. At the end of each 50-print test run, the cartridges were weighed again and the resulting weight of ink used for the test run calculated for each colour. To ensure that the sub-tank on the Canon model did not affect results, a procedure was followed to ensure that the sub-tank level was at its maximum before the print run commenced and again after the print run was completed, thereby ensuring that ink replenishment of the sub-tanks was taken into account for each print run.

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

Test Environment

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

Test Equipment

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

Test Procedures

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

CUSTOM TEST REPORT

Canon imagePROGRAF TX-3100 vs. HP DesignJet T1600dr

KEYPOINT INTELLIGENCE

About Keypoint Intelligence

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

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