BLI Comparative Lab Test Report

JULY 2014

Canon imagePROGRAF iPF785 MFP vs. HP Designjet T2500 eMFP

Canon imagePROGRAF iPF785 MFP

HP Designjet T2500 eMFP

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔	✔	
Colour Print Quality	✔	
Colour Copy Quality	✔	
Scan Capture Quality	✔	
Colour Print Productivity	✔	
Colour Copy Productivity	✔	
Colour Scan Productivity	✔	
Black Print Productivity	✔	
Black Copy Productivity	✔	
Black Scan Productivity	✔	
Direct Print Submission Functionality	=	=
Banner Printing / Copying	✔	
Walk-up Ease of Use	✔	
Device Feature Set	✔	
Print Driver Feature Set	✔	

TEST OBJECTIVE

Buyers Laboratory LLC (BLI) was commissioned by Canon Europe to conduct confidential document imaging device performance testing on the Canon imagePROGRAF iPF785 MFP and the HP Designjet T2500 eMFP, and produce a report comparing the relative strengths and weaknesses of the two products in terms of image quality, productivity, direct print submission functionality, banner printing, walk-up ease of use, device feature set and printer driver feature set. All testing was performed in BLI's test facility in Wokingham, UK.

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Executive Summary

The Canon imagePROGRAF iPF785 MFP gave an excellent overall performance in BLI's testing, outperforming the HP Designjet T2500 eMFP in all categories tested. Specifically, the Canon model delivered far greater productivity than the HP Designjet T2500 eMFP in print, copy and scan modes. Remarkably, although speeds were comparable in Fast mode, the performance advantage for the Canon model over the HP model increased along with the quality mode, with print and scan speeds that were over twice as fast, and copy speeds that were significantly faster in High/Best quality mode. The Canon model also offers a stronger device feature set and more feature-rich driver functionality. Thanks in part to its large 22" touchscreen display, the Canon model also proved to be easier to use and maintain, with a sub-ink tank replacement system that ensures uninterrupted printing.

As would be expected of models aimed at the GIS/CAD/AEC graphics market, both models delivered excellent GIS and AEC graphics, with the Canon model delivering better depth of field in GIS graphics on plain paper in all quality modes, with a far more realistic three-dimensional rendering of topographical features. While the HP unit produced copy output with higher optical density for all colours and more accurate colour fidelity when copying BLI's Pantone corporate logo test chart, the Canon model produced superior colour image quality overall in both copy and print modes. It delivered a larger colour gamut than the HP model when printing on glossy photo-quality paper, and in all quality modes on plain paper, and had more natural-looking skin tones, which were blueish in output produced by the HP unit. The Canon model also enjoys another important image quality advantage—the option of unidirectional printing in the driver, even in Draft mode, helping it to avoid the banding that's evident across the full width of the image when using the HP device's bidirectional printhead in every mode except Best.

In terms of operational ease of use, the Canon unit has some significant advantages over the HP device, whose lack of batch scanning capability and inability to support PDF file formats (only available with its more expensive PostScript version) are limitations. The Canon SmartWorks MFP interface entails a simplified, time-saving Scan/Adjust/Print workflow. In contrast, the HP model entails a workflow of Scan/Print/Check Print/Change Settings and Re-scan/Reprint/Repeat as necessary, which is clearly more time-consuming in real-world workflows.

Advantages for the HP model include its dual-roll design, and superior 50-sheet stacker, its ability to print from smartphones and tablet devices, its more compact footprint and slightly lower noise emissions.

In some respects both models offered mixed advantages and disadvantages. For example, while the HP model has lower energy consumption during operation, the Canon model has lower power consumption in standby mode, the mode these devices are likely to be in more of the time. Both models allow files to be retrieved from cloud storage for printing. Although as noted, the Canon model supports direct PDF submission (only available with the HP's more expensive PostScript version) without the need to open an application. HP's ePrint & Share offers some functionality not offered by the Canon unit, including automatic saving to the cloud of all printing tasks and support for printing from Apple or Android smartphones or tablets (Canon will launch an app for iPad users in August). That said, BLI analysts found the process for sharing files with HP's ePrint & Share to be a more tedious and time-consuming process. Canon users who are registered with Google Drive will have instant access to its hierarchical folder system, in contrast to the flat file structure of HP's ePrint & Share.

Colour Image Quality

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Text	✔	
Fine Lines	✔	
Halftone Range	=	=
Halftone Fill	=	=
Solid Density	=	=
AEC Graphics	=	=
GIS Graphics	✔	
Business Graphics	✔	
Photographic Images	✔	
Colour Gamut (plain paper, default settings)	✔	
Colour Gamut (matte coated paper, High/Best quality settings)	✔	

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

\+ An important factor influencing overall image quality is the Canon model's option of using unidirectional printing, even in Draft mode. The HP model only offers bidirectional printing, so that the printhead travels in both directions over the image, creating a noticeable pattern of banding across the whole width of output in all modes except Best quality. The Canon model is free from any banding, even in Draft mode, when unidirectional printing is selected.

○ In the highest quality mode, the HP model delivered higher optical densities on plain paper for cyan and magenta, while the Canon model delivered higher density for yellow and black.

\+ The Canon model delivered a very good halftone range in colour mode, with distinct transitions between all levels even in Fast mode, whereas the HP unit delivers distinct transitions only in Normal and Best modes.

○ When evaluating text in Fast and Standard/Normal modes there were only slight differences in the output of the two models, with fonts that were legible down to the 4-pt. level with no breakup, but some shadowing in output produced by the Canon model and some indistinctness in the output produced by the HP unit.

\+ In High/Best mode, fonts were legible down to the 4-pt. level with both models, but those delivered by the Canon unit were much crisper.

\+ Fine lines remained distinct down to the 0.1-pt. level in all modes on both devices, with no evidence of stair-stepping in diagonal lines. Even in Fast mode, the Canon unit delivered highly distinct vertical lines, whereas the HP in Fast mode produced vertical lines that displayed some fuzziness.

○ Both models delivered a very good halftone range—from the 10% to 100% dot-fill levels in all modes, with distinct transitions between all levels.

+ Both devices were rated very good in all modes for halftone fill except in Fast mode in which the HP unit's transitions were much less distinct.

○ When evaluating Architectural, Engineering and Construction (AEC) graphics in Normal/Standard and High/Best modes, both models delivered detailed and distinct fine lines and a high level of accuracy.

+ When outputting Geographic Information Systems (GIS) graphics in High/Best mode on plain paper, the Canon unit delivered a finer level of detail and much greater depth of field than the HP model, giving a more realistic three-dimensional appearance to topographical features.

+ The colour business graphics produced by the Canon unit exhibited smoother transitions from light to dark areas and finer details than the HP device.

+ In photographic images, the Canon model delivered better detailing in dark contrast areas and more natural-looking skin tones, while the skin tones produced by the HP device were distinctly blueish.

+ When printing on plain paper, the Canon iPF785 MFP delivered a larger colour gamut in all four quality modes, with a CIE volume of 118,881 in Fast Economy mode compared with a mere 14,163 with the HP unit (eight times higher than HP); 203,359 in Fast mode (112.4% higher than the HP unit); 273,359 in Standard mode (65.2% higher than HP) and 272,598 in High quality mode (47.9% higher than HP).

+ Printing on each vendor's own brand of glossy photo quality paper, the Canon model again delivered a larger colour gamut, with a CIE volume of 488,074, which is 17.5% higher than HP's CIE volume of 415,256.

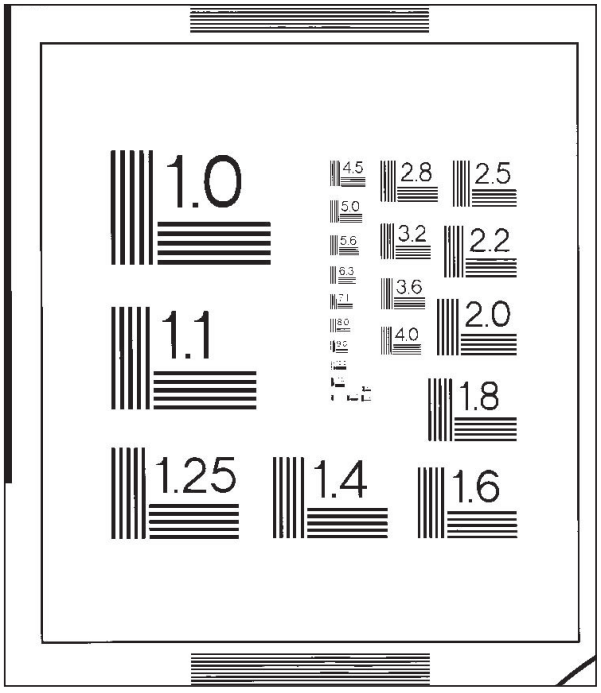
+ BLI's overall assessment of colour and black image quality is that the Canon model was clearly superior, with a larger colour gamut in all modes and on all media types, a finer level of detail in photographs and colour business graphics, and none of the fuzziness in text and line art which output from the HP device showed under magnification. While both models delivered detailed and distinct fine lines in AEC drawings, the Canon device delivered superior GIS graphics in all modes. While the HP device delivered higher density for cyan and magenta in High/Best mode, the Canon device had the advantage in density for yellow and black. In High quality mode, fonts produced by the Canon model were much crisper than those produced by the HP model. The Canon model also has the advantage of offering the option of using unidirectional printing to avoid the banding that was present across all HP output except in Best mode.

Copy Quality

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Text	✔	
Fine Lines	✔	
Solid density		✔
Halftone reproduction	✔	
Colour Fidelity		✔

+ When evaluating text copy quality using the QA-1 test chart, fonts were legible down to the 6-pt. size (the smallest level on this chart) in all modes with the Canon model, with crisp characters, no breakup and no sign of haloing. In copied output produced by the HP device, however, fonts were legible only down to the 8-pt. level in Fast mode, with weaker characters and some distortion. In Normal and High modes in output produced by the HP unit, fonts were legible at the 6-pt. level but were less well defined and some haloing was evident whereas fonts produced by the Canon unit were rated as excellent.

+ When evaluating fine lines using the same QA-1 test chart (see below) where the emphasis is on evaluating whether there is a clear distinction between lines, rather than the rendering of each line, the fine lines produced by the HP model in Fast mode remained distinct only up to 2.2 cpm (cycles per millimeter) level, compared with up to 2.5 cpm with the Canon unit. In Normal/Standard mode, they were distinct up to the 2.5 level in the output of the HP model and 2.8 in the output of the Canon device. In Best/High quality mode, lines were distinct up to the 2.2 level with the HP device, compared with up to the 3.2 level with the Canon MFP.



Portion of QA-1 Image Evaluation Test Target used to evaluate fine line reproduction

— Solid density was higher for all colours with the HP T2500 in copy mode.

+ Halftones produced by the Canon unit were well graduated in copy mode in all quality modes, whereas greyscale output from the HP device was contaminated by some cyan and magenta, even in High quality mode. Colour halftones were rated very good for both models.

+ However, the solids on the QA-1 test chart reproduced with the Canon unit were dark and consistent in all quality modes, whereas the solids produced by the HP T2500 had a 'washed out' appearance in Fast and Normal modes, and only matched the Canon output in Best mode.

— In BLI's colour fidelity testing with 12 Pantone shades for corporate logos, the HP device had a lower average Delta E shift of 10.4 compared with 16.8 for the Canon unit.

Scan Capture Quality

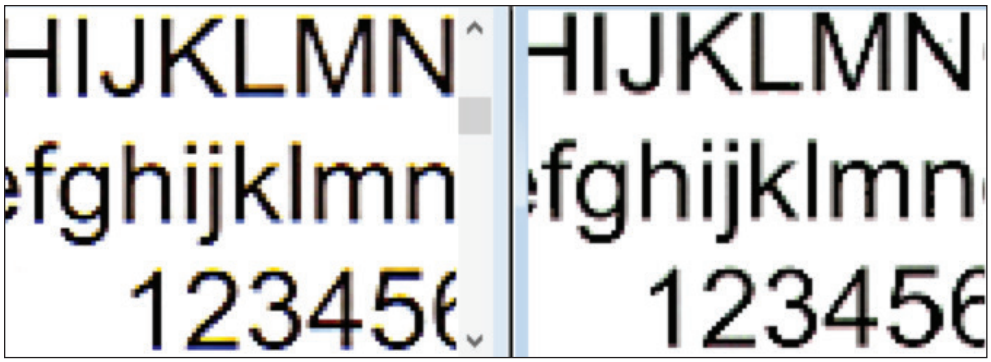
	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Resolution and Sharpness at Optical Resolution	✔	
Text	✔	
Fine Lines	✔	
Geometric Accuracy	=	=
Halftone Capture Quality	✔	

+ When scanning text and fine lines using the QA-1 test chart, the Canon iPF785 clearly benefitted from using its maximum 1200 dpi resolution, whereas the HP Designjet T2500 eMFP has a maximum resolution of only 600 dpi. As PDF file formats are only supported by HP's more expensive PostScript model, the file was saved as a TIFF file.

+ As illustrated below (under magnification) the Canon model delivered fonts that were more crisp and distinct than those produced by the HP unit, with none of the ghosting that was apparent in fonts with the HP model in Fast mode.

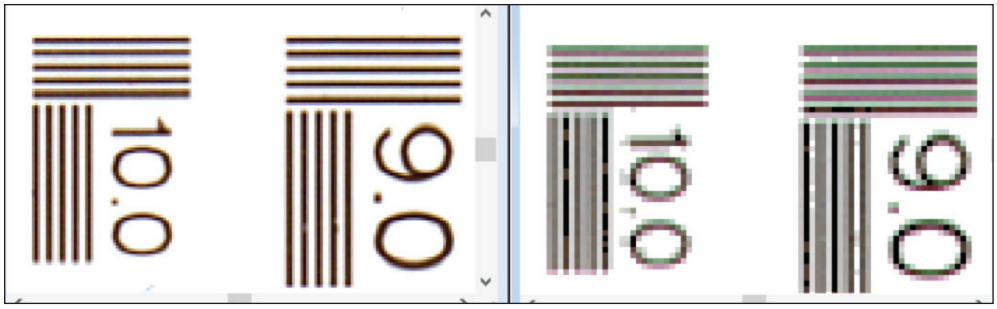
Canon (left) and HP (right) fonts at maximum resolution. Although the HP fonts are darker they are less well defined. All images were scanned using the Colour Line setting on both models.

○ Text produced by both models (using line preset) at 300 dpi was legible down to the 6-pt. level, with very little difference between them.

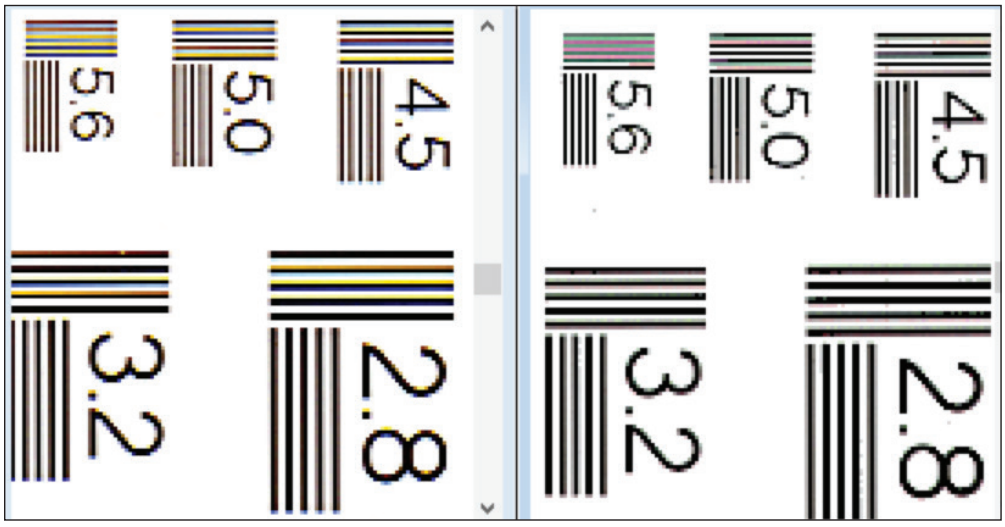


Canon (left) and HP (right) fonts at 300-dpi resolution.

+ In the MTF Line Pairs Test, where the emphasis is on evaluating whether there is a clear distinction between lines, rather than the rendering of each line, fine lines at 300 dpi were distinct up to the 4.5 level in output produced by the Canon unit, but only to the 4.0 level in output produced by the HP model.



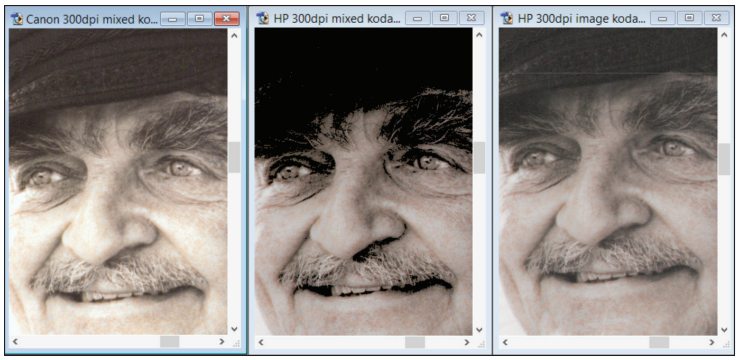
Canon (left) and HP (right) fine line pairs at maximum resolution.



Canon (left) and HP (right) fine line pairs at 300-dpi resolution.

○ Using the Adobe Photoshop Measuring Tool to evaluate geometric accuracy (defined as the variation between the actual document measurement and the length of the scanned image), both the Canon and HP models delivered highly impressive accuracy, with a variation of just 0.1 mm in landscape and 0.1 mm in portrait for Canon, compared with the HP model's 0.0 mm in landscape and 0.2 mm in portrait (see Supporting Test Data).

+ When scanning the mixed text/image BLI test chart in full colour at 300 dpi, BLI analysts found that the Canon MFP when left in default Mixed mode delivered far more subtle gradations of halftone shades, especially in dark contrast areas, whereas areas of the darker halftones lost a lot of integrity when scanned by the HP Designjet T2500 eMFP. The quality of HP's halftone capture improved markedly when the Image mode was selected.



Halftone capture in full colour at 300 dpi with the Canon (left) and HP models (centre and right, in Mixed and Image modes respectively).

+ The Canon model includes an Index Colour Function, allowing operators to capture documents with some colour content (e.g., highlights or red handwritten notes) without having to use the slower, more bandwidth-hungry full colour mode. This allows faster scanning speeds compared with full-colour workflow.

Print Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
First Page Out	✔	
Throughput Speed (fastest mode)	✔	
Throughput Speed (default mode)	✔	
Throughput Speed (highest-quality mode)	✔	
Job Stream (multiple jobs submitted to device in fast succession simulating busy network environment)	✔	

+ The Canon iPF785 MFP delivered a faster first-page-out time of 89.22 seconds after a weekend of non-use, compared with 120.77 seconds for the HP device. Warm-up time before printing commenced was 49.19 seconds for the Canon model, faster than the 56.57 seconds for the HP unit.

+ The Canon iPF785 delivered a faster first-page-out time of just 59.87 seconds from its ready state, compared with 79.30 seconds for the HP device.

— However, warm-up time from ready state before printing commenced was 19.47 seconds for the Canon model, compared with 16.79 seconds for the HP unit.

+ When printing BLI's job stream, designed to simulate a typical mixed workflow for a large-format unit, the Canon model was 2.4% slower than the HP model in Draft/Fast mode, but 23.9% faster in Standard/Normal mode, and 53.2% faster in High quality/Best mode.

+ When printing BLI's 12-page DWF test file in colour, the Canon unit was 10.4% faster in Draft/Fast mode, 39.7% faster in Standard/Normal mode, and 51.5% faster in High quality/Best mode when compared with the HP unit.

+ When printing BLI's 12-page DWF test file in monochrome, the Canon unit was 6.2% faster in Draft/Fast mode, 36.8% faster than the HP model in Standard/Normal mode and 50.6% faster in High quality/Best mode.

+ In BLI's single-page A0-size House 3D PDF test, the iPF785 MFP delivered a first-page-out time that was 25.0% faster than the HP T2500 unit. Similarly, the time to print five A0-size pages was 31.8% faster for the Canon unit than the HP device.

Copy Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
A1(Landscape) First Page Out	=	=
A0 First Page Out	✔	

○ In BLI's A1 (Landscape) testing in Fast mode the first-copy-out times were almost identical for both models.

— In BLI's A1 (Landscape) testing in Standard/Normal mode, the Canon iPF785 MFP's first-copy out time was identical in monochrome, 28.4% slower in greyscale and 3.1% slower in colour than the HP Designjet T2500 eMFP.

+ However, in both models' Best quality mode the Canon model was 53.5% faster in monochrome, 36.4% faster in greyscale and 20.6% faster in colour than the HP unit.

+ In BLI's A0 testing in Fast mode, the HP Designjet T2500 eMFP's first-copy out time was 18.8% slower than Canon's in monochrome, 4.7% slower in greyscale and 4.4% slower in colour than the Canon model.

— In Standard/Normal mode, the HP Designjet T2500 eMFP's A0 first-copy out time was almost the same as Canon's in monochrome, but 17.4% faster in greyscale and 3.9% faster in colour than the Canon model.

+ However, in both models' Best quality A0 mode the Canon model was 52.4% faster in monochrome, 36.0% faster in greyscale and 22.1% faster in colour than the HP unit.

Scan Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Single-Page Scanning	✔	
First Page Out to Desktop	✔	

+ Batch scanning is not supported by the HP Designjet T2500 eMFP, so no times could be recorded by BLI. In some environments this could have a highly adverse effect on productivity.

+ In BLI's scan-to-desktop A1 (Landscape) testing, measuring the time taken from initiation to the scan appearing at the desktop, the Canon iPF785 MFP was 59.5% faster than the HP model in monochrome at 200 dpi, and 69.6% faster at 300 dpi; in greyscale the Canon model was 48.4% faster at 200 dpi and 58.1% faster at 300 dpi; in colour mode the Canon model was 43.3% faster at 200 dpi and 59.5% faster at 300 dpi.

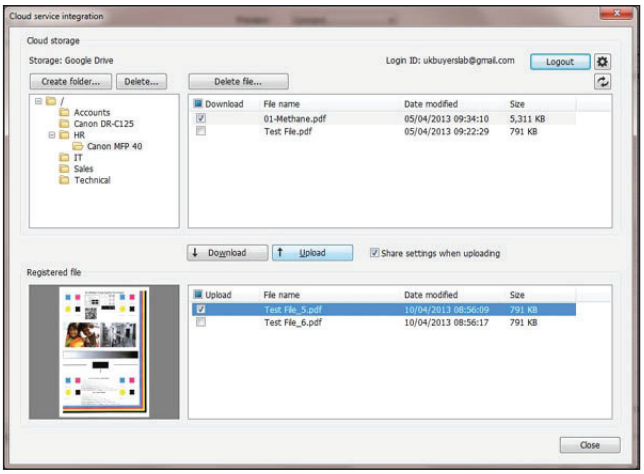
+ In BLI's scan-to-desktop A0 testing, the Canon iPF785 MFP was 65.6% faster than the |HP model in monochrome at 200 dpi, and 75.6% faster at 300 dpi; in greyscale mode, the Canon model was 54.9% faster at 200 dpi and 65.3% faster at 300 dpi; in colour mode, the Canon model was 46.1% faster at 200 dpi and 59.9% faster at 300 dpi.

+ In BLI's A1 (Landscape) scan throughput testing, timing from initiation to the scan exiting the scanner, the Canon iPF785 MFP was 52.9% faster than the HP model in monochrome at 200 dpi, and 71.4% faster at 300 dpi; in greyscale mode, the Canon model was 34.8% faster at 200 dpi and 57.1% faster at 300 dpi; in colour mode the Canon model was 31.7% faster at 200 dpi and 54.8% faster at 300 dpi.

+ In BLI's A0 scan throughput testing, the Canon iPF785 MFP was 63.5% faster than the HP model in monochrome at 200 dpi, and 78.0% faster at 300 dpi; in greyscale mode, the Canon model was 51.5% faster at 200 dpi and 69.7% faster at 300 dpi; in colour mode, the Canon model was 31.4% faster at 200 dpi and 57.0% faster at 300 dpi—a convincing overall superiority.

Direct Print Submission Functionality

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Ease of Use	=	=
Functionality	=	=

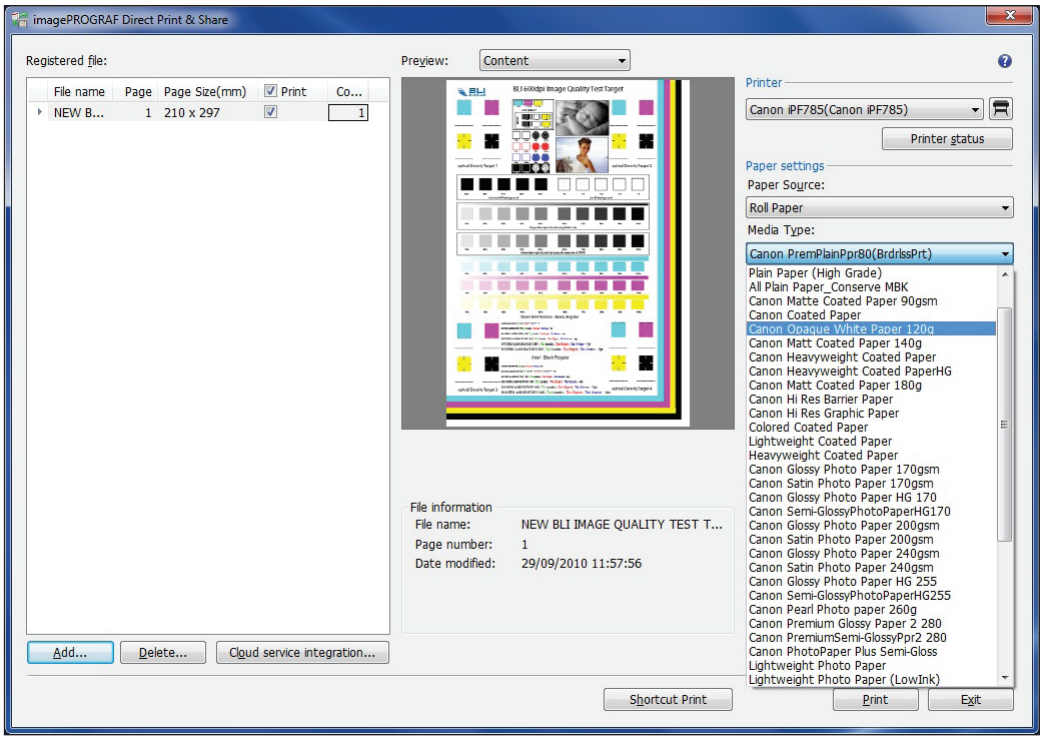


Canon's iPF Direct Print & Share Cloud Services Integration.

+ A free download from Canon's website, the iPF Direct Print & Share utility enables PDFs to be printed without opening Adobe Acrobat. iPF Direct Print & Share also allows users to retrieve files from Google cloud storage for printing. Only the HP's PostScript sister model supports direct PDF submission.

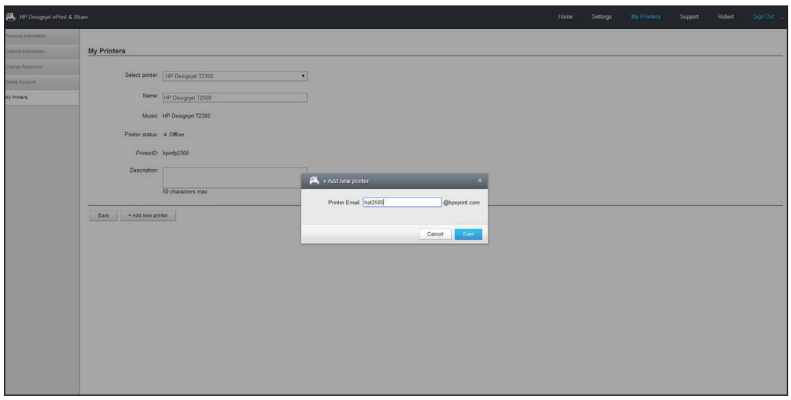
+ The latest version (v2.0) of iPF Direct Print & Share supports "Shortcut Print" functionality which defines several print settings via a desktop icon. Files are automatically printed with the predefined setting with a simple drag-and-drop operation on the icon. Multiple desktop icons can be created for different print settings.

— The HP device web server allows for job submission including full feature set control without the need for the driver to be installed on the PC.



Canon's iPF Direct Print & Share utility, showing a preview of the downloaded image in the centre and a wide range of settings on the right.

— HP's ePrint & Share web services software provides the same direct file submission and cloud storage retrieval functionality for the HP device but also supports printing from Apple or Android smartphones or tablets, and automatically saves copies of work to the cloud.



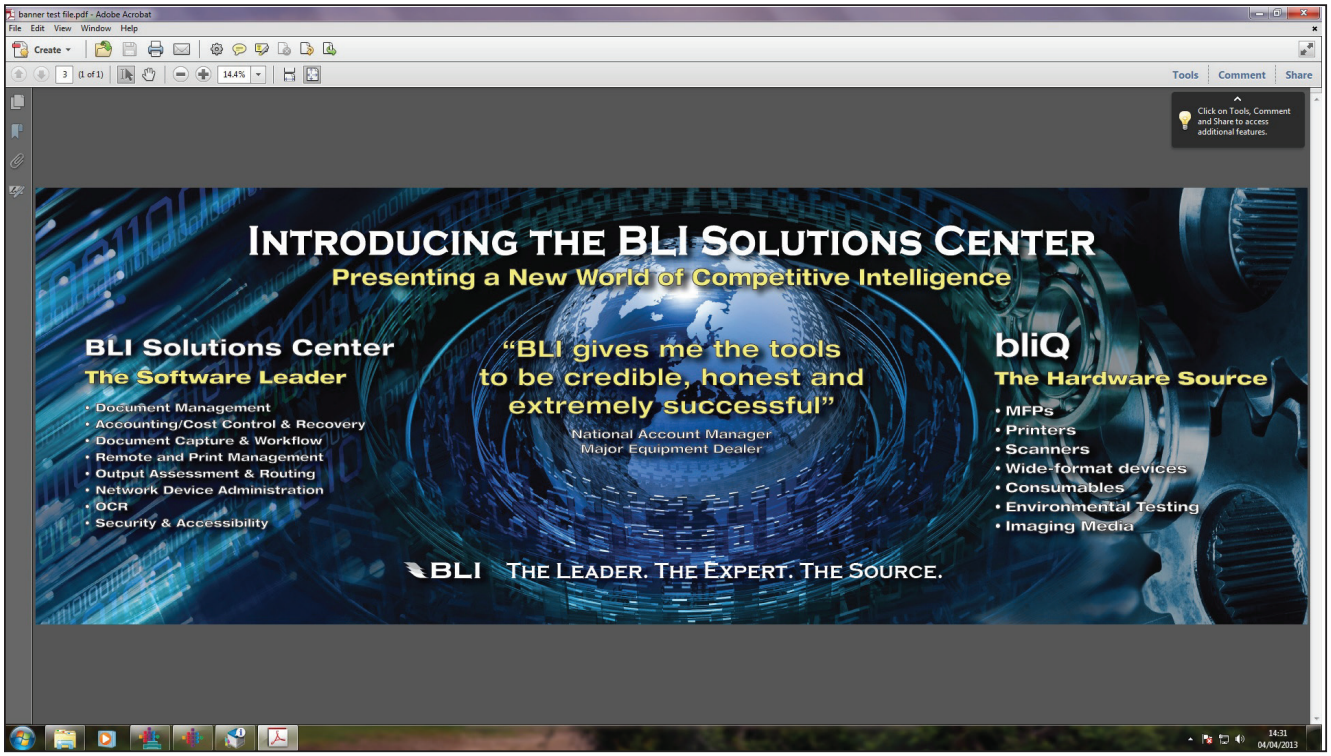
Canon's iPF Direct Print & Share utility.

Banner Printing

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Print Ease of Use	=	=
Print Productivity	✔	

+ The Canon iPF785 successfully printed BLI's 40" x 117" banner (a 4,955-KB PDF file) in Fast 300 dpi mode, taking 4 minutes and 48.3 seconds from preview to final paper cut. In unidirectional mode, a further 59.1 seconds was added to the time.

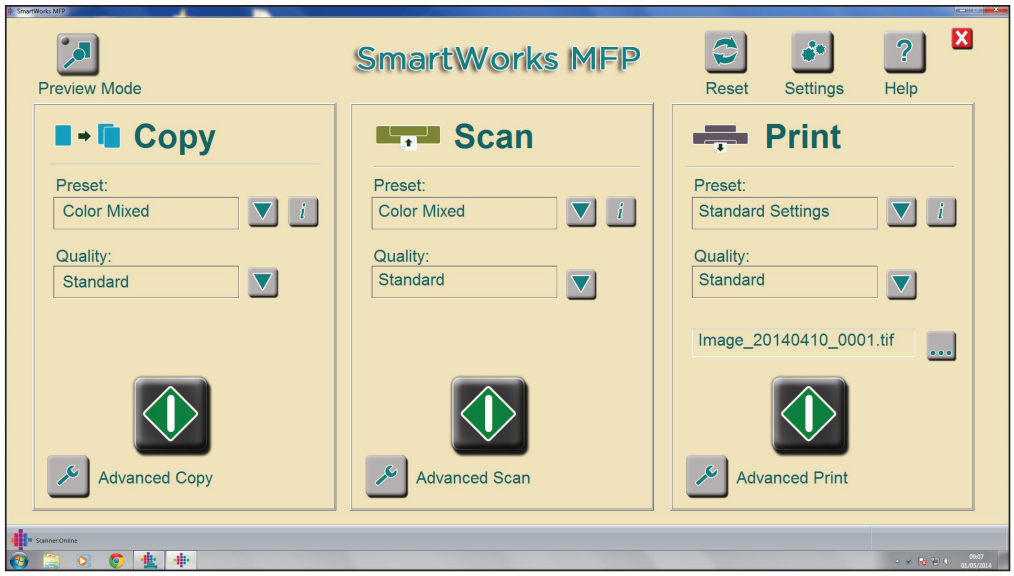
+ The HP T2500 required 6 minutes, 48.8 seconds to print the same banner in in Fast mode, with a great deal of banding across the full width. In Normal mode it took 7 minutes, 31.3 seconds, but some banding was still apparent.



BLI's Banner Test File

Walk-Up Ease of Use

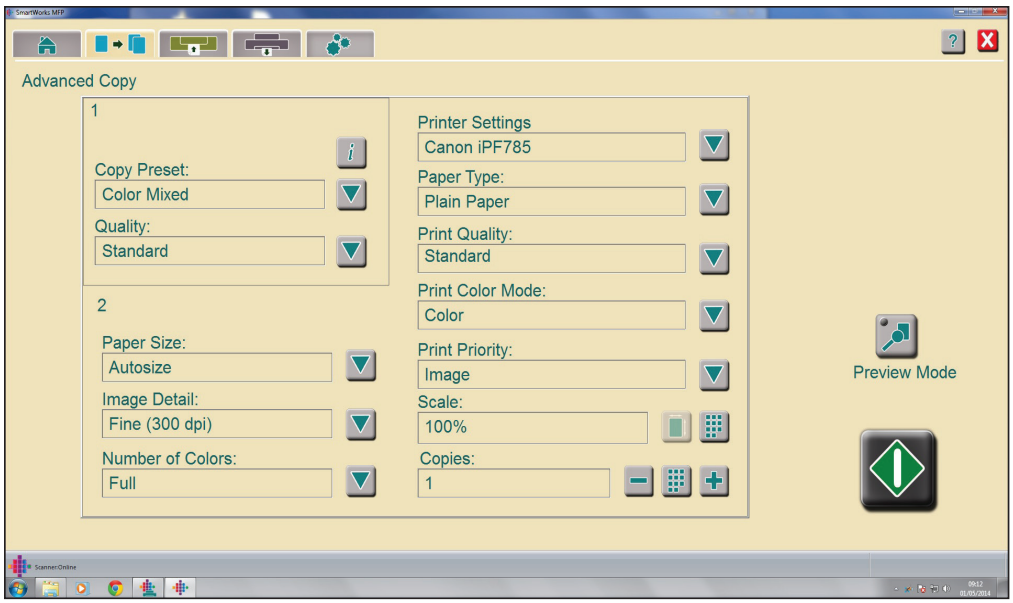
	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Advantage ✔		
Touchscreen Interface	✔	
Scanner Media Handling	✔	
Print Media Handling		✔
User Maintenance/Consumable Replacement	=	=
Copy Programming	✔	
Scan to Desktop/Network Folder Programming	✔	
Scan to email/USB/Cloud Programming	✔	
Stored Job Reprinting (including via USB key and cloud)	=	=



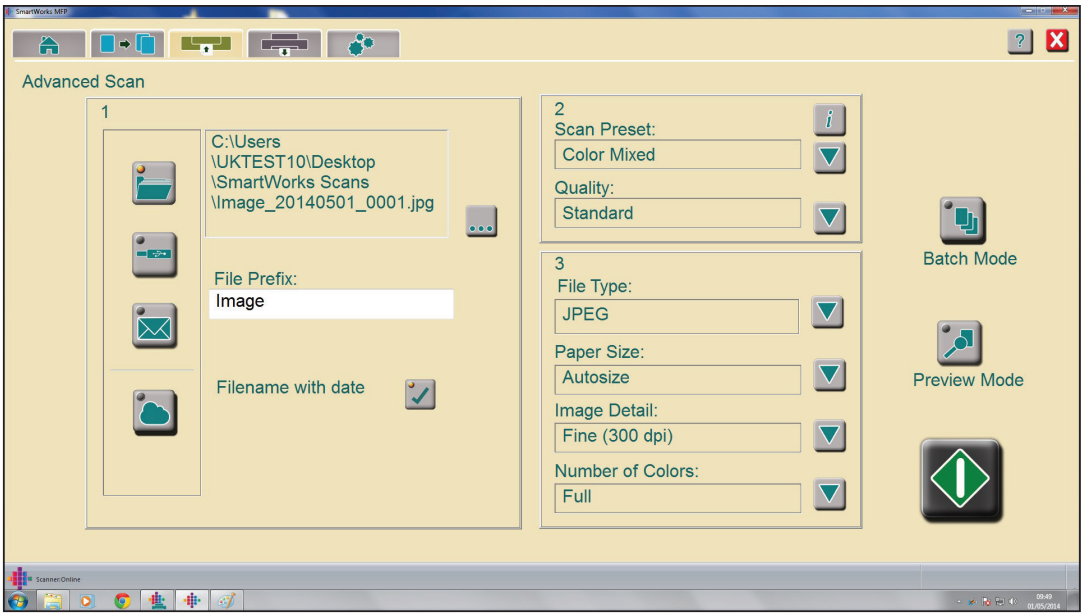
SmartWorks MFP Home Screen

+ BLI analysts were very impressed by the clear and intuitive layout of the Canon model's 22" touchscreen interface, with selections for all the main functions—Copy, Scan and Print—and full control over all settings available from the home page. Users are able to 'pinch and zoom' to enlarge specific areas of the touchscreen. A 'Virtual Keyboard' can be displayed to make it easy to enter email addresses and a numerical keypad can also be displayed for quantity selections.

○ Not all device control for the Canon is provided by the 22" touchscreen with media control, ink and printhead maintenance and other tasks being handled by the Canon printer's control panel, which is an LCD screen with hard button navigation controls.

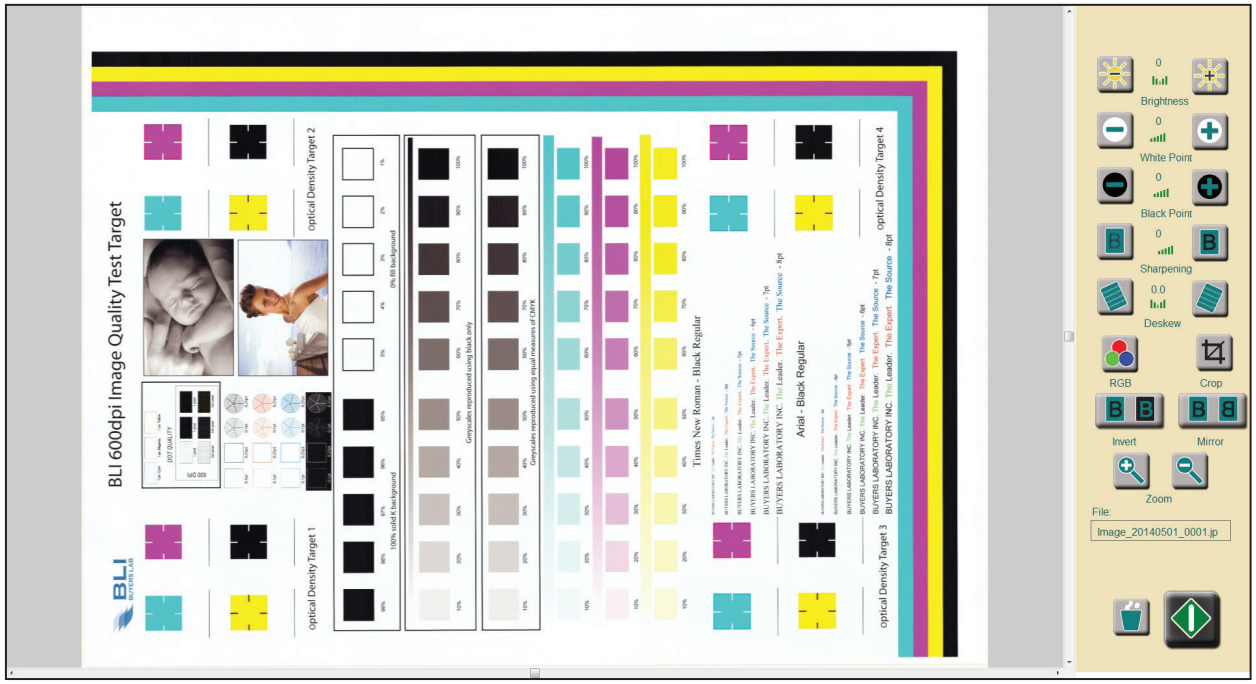


SmartWorks MFP Advanced Copy Screen



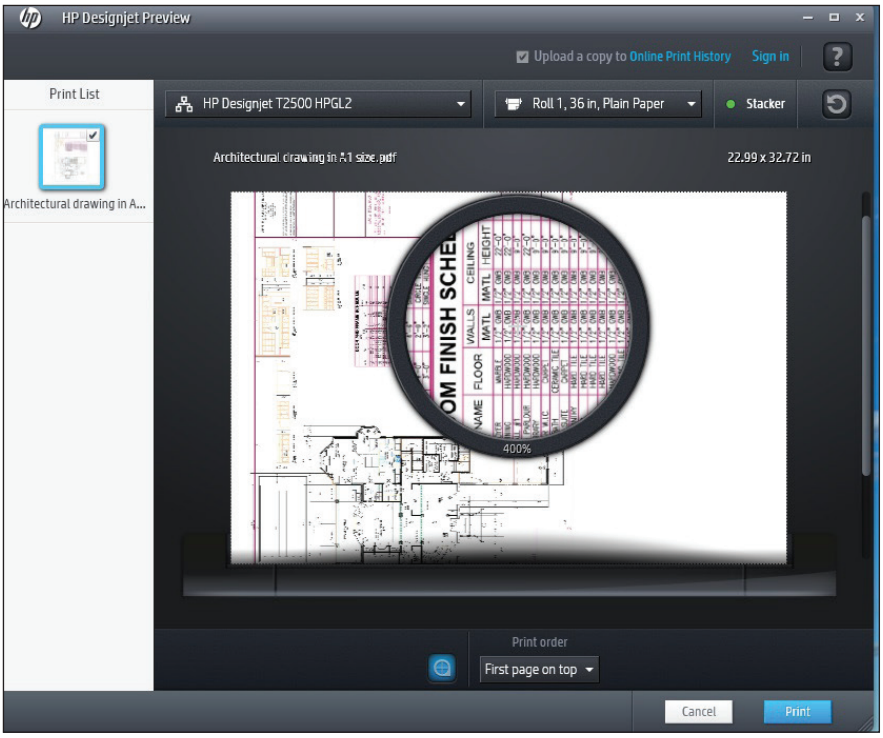
A Batch Scan selection, not available with the HP model, is on the SmartWorks MFP Advanced Scan Screen.

— HP's ePrint & Share web services software provides the same direct file submission and cloud storage retrieval functionality for the HP device but also supports printing from Apple or Android smartphones or tablets, and automatically saves copies of work to the cloud. It also supports direct submission of DWF files, a feature that the Canon utility lacks.

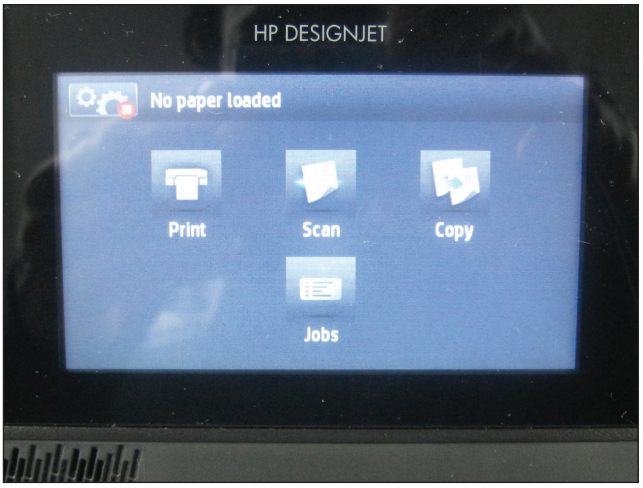


Preview screen showing the wide range of image adjustment settings on the right.

+ The Canon model's Copy, Scan and Print functions each offer a Preview screen with the document displayed in the centre and a variety of image adjustment options on the right, giving full control over image quality before jobs are released. The preview allows users to zoom in to any level of magnification on a linear scale (whereas the HP unit's preview screen permits only one level of magnification). The Canon SmartWorks MFP interface entails a simplified, time-saving Scan/Adjust/Print workflow. In contrast, the HP model entails a workflow of Scan/Print/Check Print/Change Settings and Re-scan/Reprint/Repeat as necessary, which is clearly more time-consuming in real-world workflows.

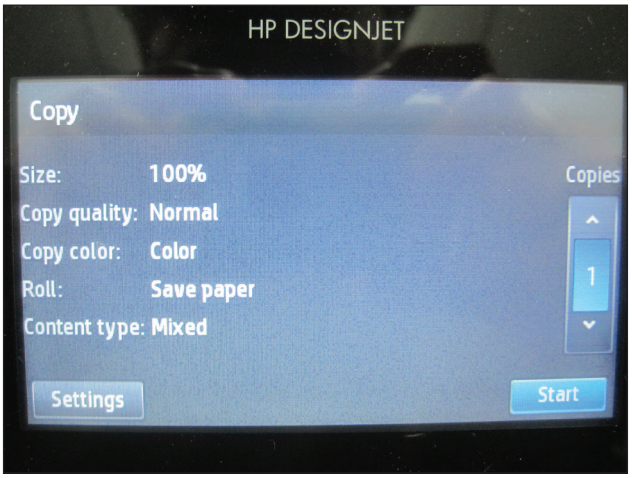


The HP T2500 HPGL 2 preview allows zooming, but only up to one level of magnification.

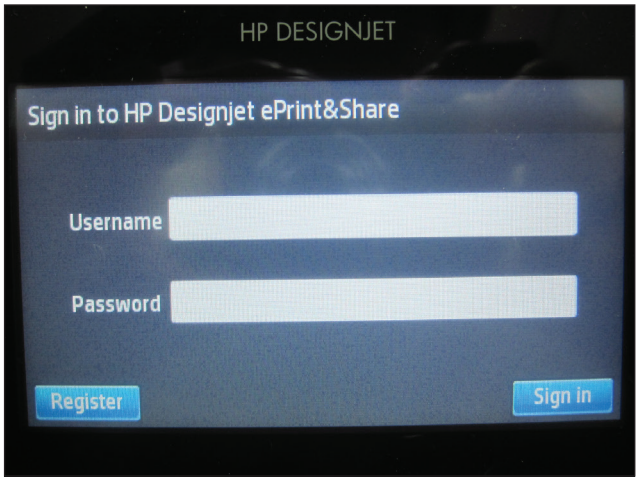


HP Designjet T2500 eMFP Home Screen

HP T2500 eMFP Preview Screen



HP T2500 Copy Screen



HP's ePrint & Share requires users to log in with an email address and password.

Percentage of ink remaining is displayed in 1% increments.

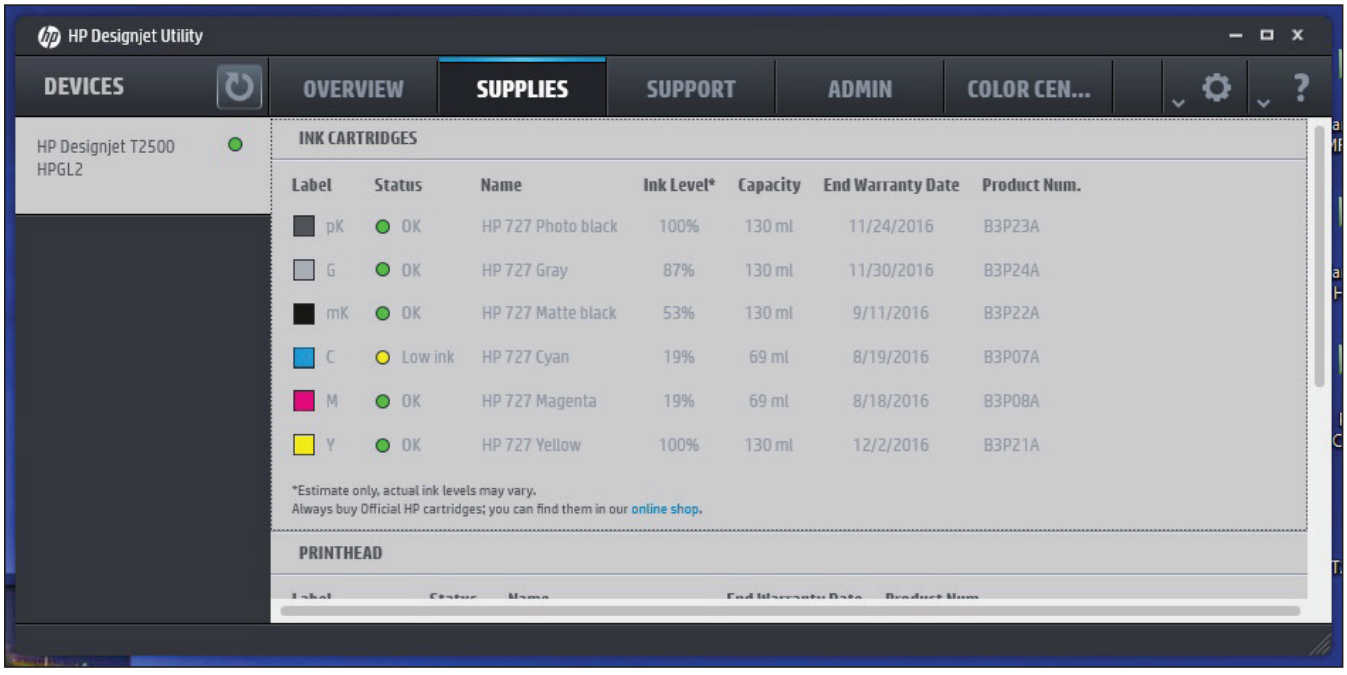
Print & Copy Job Log on the HP T2500 eMFP

Scan Image Adjustment Opening Screen

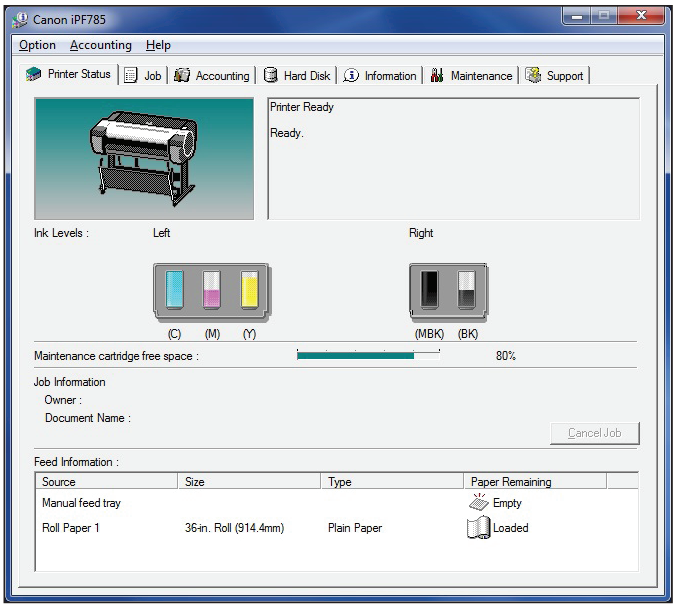
Scan Image Adjustment Second Screen

Settings Page on the HP Designjet T2500 eMFP

+ In contrast, BLI analysts found the HP model's much smaller touchscreen more difficult to use, as the screen had to be tapped quite hard to elicit any response, and the buttons on the keyboard display are so small that entering email addresses was more error-prone than with the Canon model.



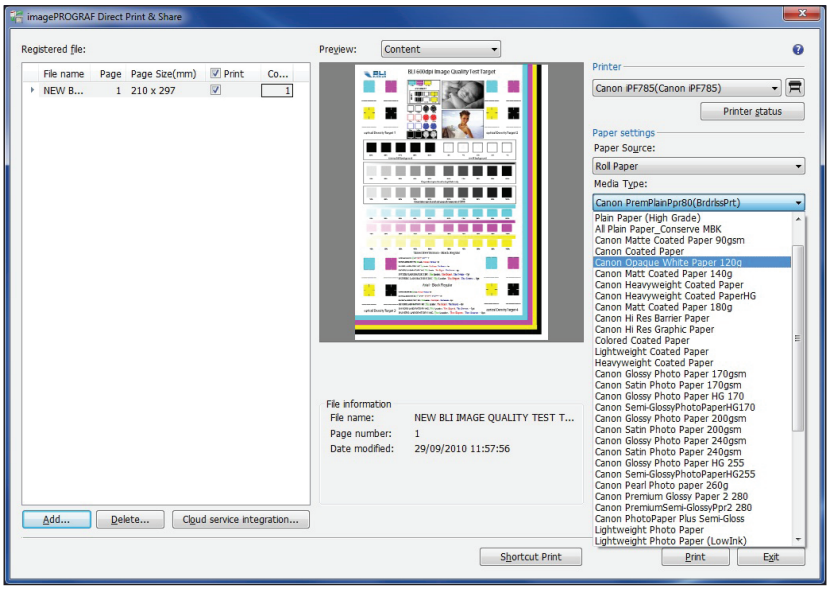
The HP Designjet Utility monitors jobs and consumable levels.



Canon's Status Monitor also provides feedback on consumable levels.

Media Handling

- Both MFPs are compatible with a wide range of media types. The Canon unit supports 44 media types, plus five user-defined media, while the HP unit supports 29, including Coated, Heavyweight, High Resolution, Matte Photo, Premium Gloss and Semi-gloss media for photographs. A specific drying time is built into many of the selections to ensure that prints will be dry after completion. Custom media types can be added and saved as well.



iPF Direct Print & Share displays a wide range of media types.

— Whereas the Canon unit only supports a single roll, the HP device supports two media rolls, making it quicker and easier to switch between media types. The HP T2500 also employs automatic roll switching, so that jobs are automatically routed to a second roll after the first is depleted. If this happens while a page is printing, the page will be printed in its entirety once a new roll is loaded without further user intervention.

\+ With the HP Designjet T2500, BLI analysts found loading cut-sheet media much more challenging than loading roll media, and they were rarely able to load sheet media correctly on the first attempt. The operator manually inserts the sheet on the right hand side, aligning the edge with a slightly raised line at the far right of the unit's cover. Several times during the loading process the control panel reported that the sheet was skewed. The media lever had to be released and the sheet repositioned before returning the lever to its locked position. This process had to be repeated several times. The Canon model, in contrast (like most competitors) has an adjustable insertion guide that makes inserting cut-sheet media a much more straightforward process.

○ Both units coped well when handling creased or folded originals.

\+ The Canon iPF785 MFP was able to scan and copy lightweight documents such as a newspaper in both portrait and landscape, whereas the HP model's scanner would not accept lightweight documents.

— BLI analysts were very impressed with the design and build quality of the HP T2500's rear-mounted stacker assembly which can hold up to 50 printed sheets of multiple media sizes in good alignment. Care should be taken not to remove any sheets during printing as this will cause a jam.

— The HP device includes a deskew function within the scanner hardware firmware, allowing skew to be compensated prior to delivery to the desktop, the Canon does not possess this capability.

○ The Canon SmartWorks software provides a means of manually adjusting skewed documents prior to saving.

User Maintenance/Consumable Replacement

○ Ink replacement is a very simple process with both devices. The HP MFP has three ink cartridges at each end, including separate cartridges for Photo Black, Matte Black and Grey. Each cartridge is slotted differently to prevent incorrect replacement.

\+ Ink cartridges can be replaced during operation with the Canon model but not with the HP device, helping to reduce downtime for Canon users.

○ Replacing printheads (three for the HP model and one for the Canon unit) is also a straightforward process.

○ The Canon device includes a maintenance cartridge that will occasionally need to be changed. This process cannot be conducted during printing. Note: BLI did not need to replace any maintenance cartridge during its extensive tests.

Copy Programming

+ The Canon touchscreen in Copy mode offers a choice of seven preset profiles for colour graphics, photographic images, etc., and new custom preset profiles can be added at any time. When a document type is selected, the optimum settings including media type and resolution are automatically displayed and any adjustments can be saved as new presets. As SmartWorks is used to enter Copy mode, whereby documents are scanned and sent to the printer via the driver, so a direct link to the device print driver is available if any more advanced settings are required. The HP does not offer preset profiles in copy mode, and can only be controlled from the control panel, not from the operator's PC.

Scan to Desktop/Network Folder Programming

+ The same 'Preview & Edit' functionality is also available in Canon's Scan mode, with a similar list of preset scan profiles and a full listing of setting selections for each and the same ability to save new presets. The 'Advanced' button offers selections for scanning to email, USB sticks, network folders or the cloud, with the option of scanning concurrently both to the cloud and one other destination, with a date stamp automatically added to the file name if desired. A button to the right selects Batch Mode so that documents can be combined together in a single folder without the need for additional third-party software. The HP model lacks this capability.

Scan to email/USB/Cloud Programming

+ As noted above, scanning to the cloud and one other destination with the Canon MFP is a quick and easy process, with files being uploaded or downloaded quickly, with no apparent delays.

+ When scanning documents to a USB stick with the HP T2500, there is no means of naming files until the USB stick is inserted into a PC. Users will find that the file has automatically been assigned a number ('HPSC001') which has to be renamed. BLI analysts commented that this is a tedious limitation which has an adverse effect on productivity.

+ However, printing from a USB stick is a straightforward process with both models, with full control over document settings, although the HP T2500's lack of support for printing PDF files (only available with the more expensive PostScript version of the MFP) is clearly a major limitation.

Stored Job Reprinting (including via USB key and cloud)

+ With the Canon iPF785, jobs which need reprinting can quickly and easily be retrieved either from the device hard drive or cloud storage using the Direct Print & Share utility, with the same Preview & Edit functionality giving full control over output quality and settings. A direct link to the driver is also available so that advanced settings, including those for Account Manager, can be reviewed and selected.

— With HP's ePrint & Share utility, the 'Online library/Store and Print' checkbox enables users to store files in an online library at the same time they are being printed on the Designjet printer. These files can be easily accessed by any colleagues who are registered as users of ePrint & Share by creating 'Shared Events.' Clicking the 'Share' button automatically uploads the files to the ePrint & Share library and simultaneously sends an email.

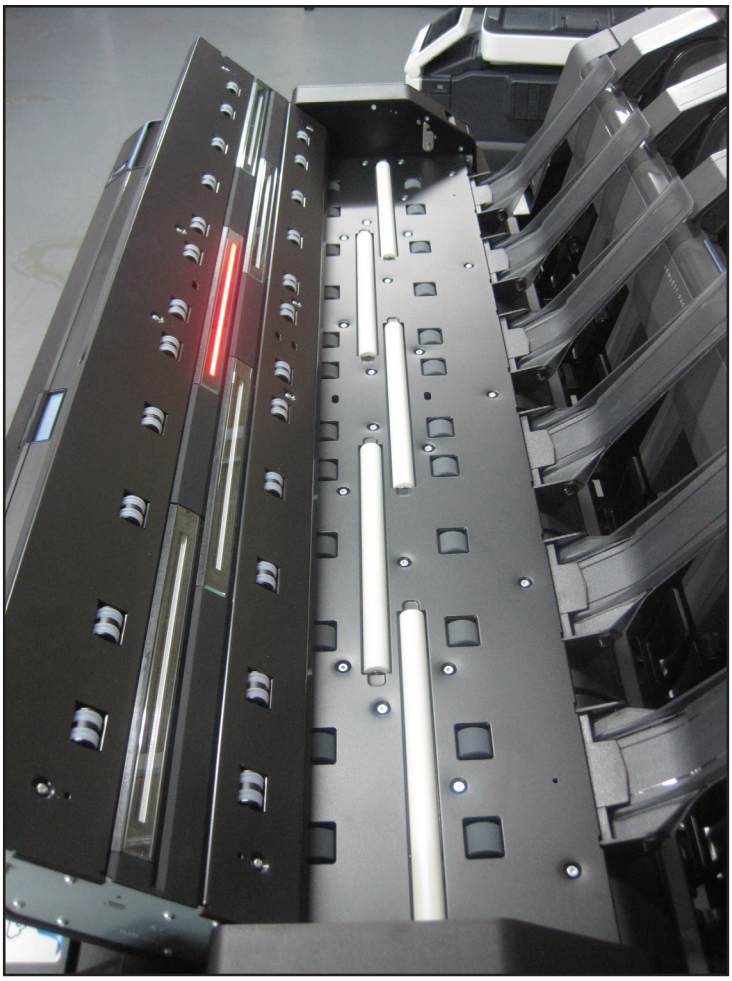
○ See the section on Direct print submission above for BLI's analysis of the differences between the two utilities in terms of functionality and ease of use.

Device Feature Set

+ The Canon iPF785 offers a 22" touchscreen LCD display for copy and scan functionality, whereas the HP T2500 eMFP has a 4.3" Touchscreen LCD display. As noted above, although the HP touchscreen interface allows users to scroll through menus quickly, in practice it proved to be less responsive and to require more 'trial and error' when compared with the Canon touchscreen interface.

— The HP device's web server offers some functionality not matched by the Canon device including: front panel lock, temporary file deletion from the hard drive, email alerts, job submission and job reprinting

Canon's SingleSensor array extends across the full width of the scanner.



HP T2500 scanner, showing its staggered array of RGB LEDs.

+ The Canon MFP's scanner offers a wider range of six scanning resolutions from 100 to 1200 dpi, whereas the HP unit's scanner only offers three, from 200 to 600 dpi.
+ As confirmed by BLI's test results, the Canon unit's colour scanning speeds are twice as fast as those of the HP device, and the black speeds are almost three times faster.
+ The Canon scanner offers superior media-handling capabilities, handling documents up to 42" by 15 m in size compared with 36" by 15 m with the HP scanner. When the rear exit paper path is used, the Canon scanner can accommodate media up to 2.0 mm thick, compared with just 0.8 mm with the HP scanner.
+ Scanned images can be saved as TIFF, JPEG or PDF files with the Canon unit, while the HP device only offers PDF file support with the more expensive PostScript version of its MFP.
+ Batch scanning is not supported by the HP T2500 eMFP, which would have an adverse impact on productivity in many environments.

+ The Canon scanner offers a much wider range of preset document types, including some with background removal, in contrast to just three (Line, Mixed and Image) for the HP scanner. In addition, custom presets with a wide range of image processing options (skew, crop, brightness, sharpen, black point, white point and invert) can be saved on the Canon MFP, a feature not offered by the HP scanner.

+ The Canon iPF785 MFP has 300ml ink tanks for all colours as opposed to HP having 300ml only for matte black.

+ The total capacity of Canon's starter cartridges (490 ml) is more generous than the 269 ml provided by HP.

+ As noted above, ink cartridges can be replaced during operation with the Canon model but not with the HP device.

+ The Canon unit supports a larger diameter of roll paper (150 mm as opposed to 135 mm with the HP device), and a higher maximum cut-sheet media length of 1.6 m compared with 1.5 m for the HP unit.

+ Canon supports up to 0.8mm as the maximum media thickness for the printer as opposed to HP supporting a maximum of 0.5mm

+ Canon's adjustable output catch tray can stack printed sheets more neatly (and in the correct sequence) than the HP catch basket, making collating output much easier.

— However, HP users can opt to use the HP T2500's rear-mounted stacker assembly which can hold up to 50 printed sheets in perfect alignment. BLI analysts were impressed with its design and build quality, but users should beware of removing sheets during printing as this will cause a misfeed.

○ The HP device offers the same hard drive capacity of 320 GB, as with the Canon iPF785.

— The HP T2500 eMFP is a more compact device than the Canon model, with a comparable weight of 112 kg versus 117 kg for the Canon unit.

— The HP T2500's rated power consumption is lower than that of the Canon model's while printing.

○ However, both models have low power consumption in standby mode (in which they will likely spend most of their time).

○ Rated noise emissions are slightly higher with the Canon device (48 dB versus 47 dB with the HP model) but lower with the Canon device in standby mode (35 dB versus 39 dB with the HP model).

Driver Feature Set

+ The Canon iPF785 has five speed settings (Fast 300, Fast 600, Standard 600, High 600 and High 1200), as opposed to three with the HP device (Fast, Normal and Best). Note: not all speed settings are available with all media types.

+ The Canon GARO driver provides an overview of the settings for predefined profiles, unlike HP's HP-GL/2 driver.

○ Both the Canon and HP drivers support multi-up (2 to 16) printing, and a 2 by 2 poster mode.

+ Unlike the HP driver, the Canon driver offers page stamping (Date, Time, Name and Page Number).

+ The Canon GARO driver offers a wider range of built-in adjustments for CMY balance, brightness, contrast and saturation than the HP-GL/2 driver. ICC profile settings are also available in the GARO driver's matching tab under Advanced Settings. Operators can select four matching modes (driver, ICC, driver ICM and host ICM matching) and choose one of four rendering methods (auto, perceptual, colorimetric or saturation). Note that 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 (as of March 2014), plus the ability to preview images before printing—features which were not included in the Startup driver disk supplied to BLI with the device.

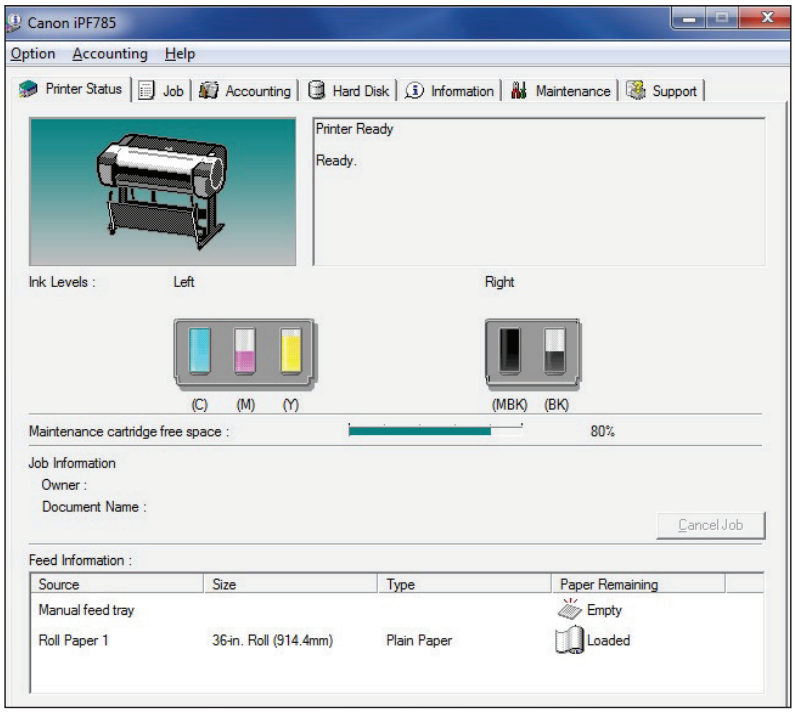
+ The Canon driver offers unidirectional printing, even in Draft mode. This means that the printhead travels in only one direction to create the desired image, helping it to avoid the banding that's evident across the full width of the image when using the HP device's bidirectional printhead in every mode except Best.

+ The Canon driver includes the Colour imageRUNNER Enlargement Copy Mode utility, which enables users to integrate a Canon small-format MFP device on the network with the iPF785. Documents scanned by the Canon MFP are automatically routed to a hot folder that is monitored by the driver of the iPF785. The image is then resized and printed, offering a fast, easy-to-use poster creation tool for office users. There is no such feature offered to HP users.

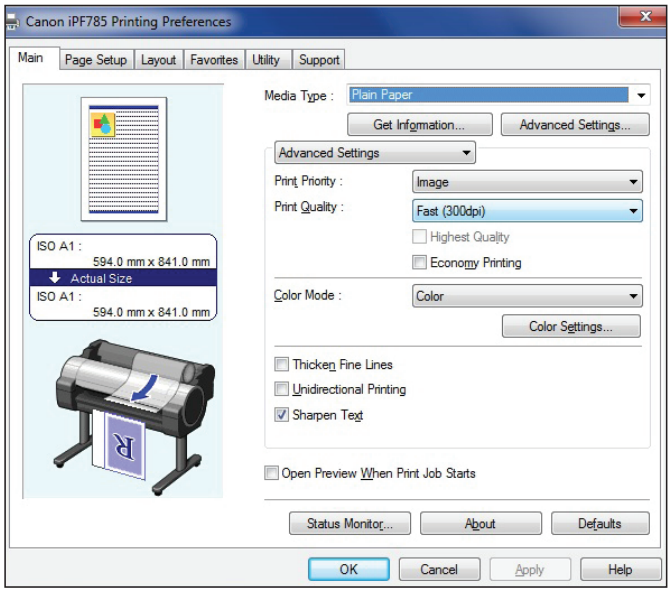
+ The Canon driver also includes a Free Layout nesting tool that enables files—even files created with different applications—to be scaled, resized, or grouped together as a single job from the printer driver. Images can be dragged and dropped to their desired locations and printed together on a single page.

○ The Canon model also offers a plug-in for printing from Microsoft Office applications that includes useful tools for automatic media resizing, nesting and borderless printing.

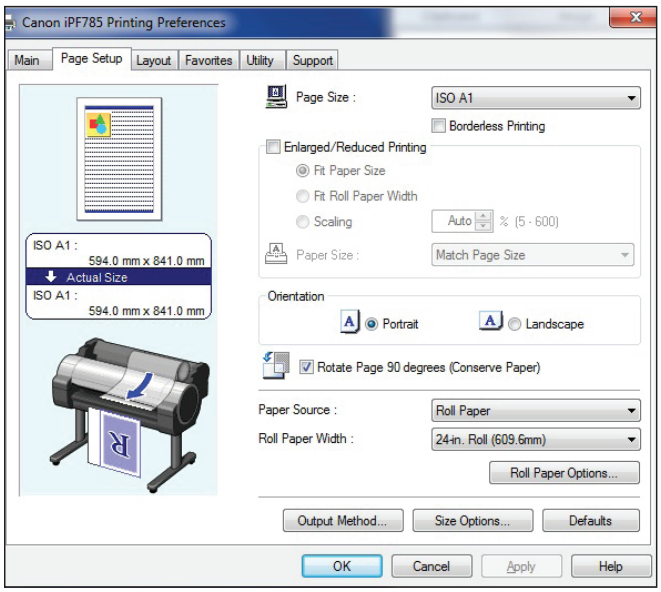
— For HP users, there are a variety of plug-ins for ePrint & Share including AutoCAD, MS Office, Outlook (attachments) and Windows Explorer, plus 'HP Designjet Go Web,' a virtual printer driver that allows users to create a print-ready PLT file and manage it in the ePrint & Share Printing tool from any Windows application, even if a specific plug-in for that application doesn't exist.



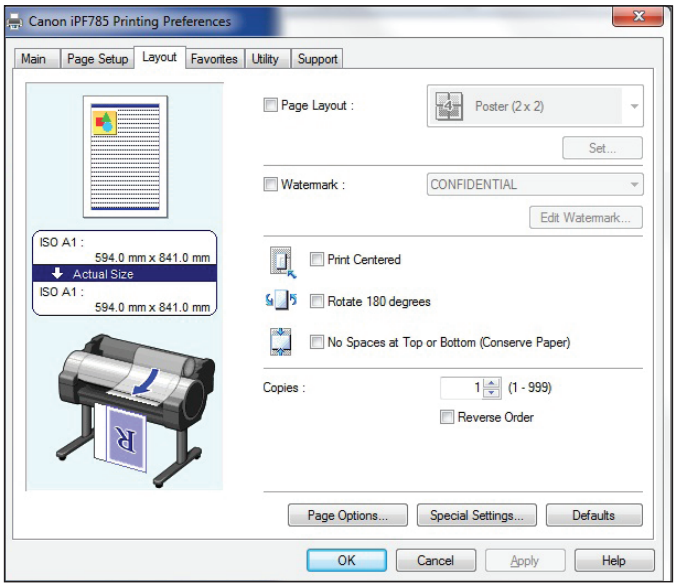
Printer Status tab indicates consumable levels and accounts for device usage.



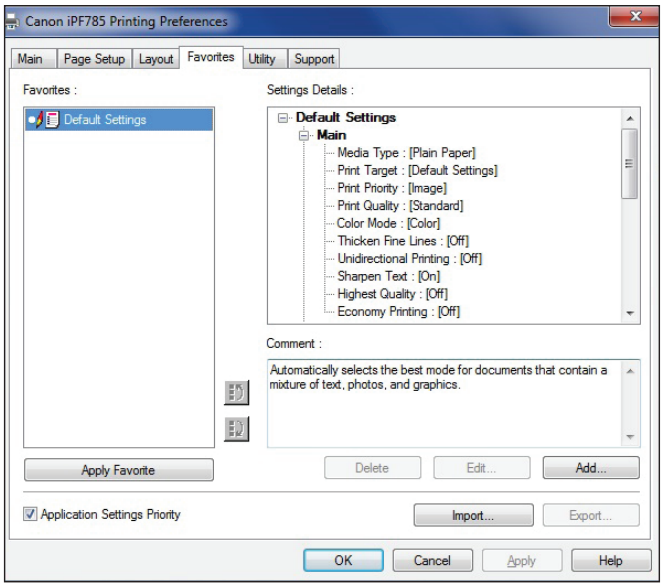
Canon Print Driver Main Tab



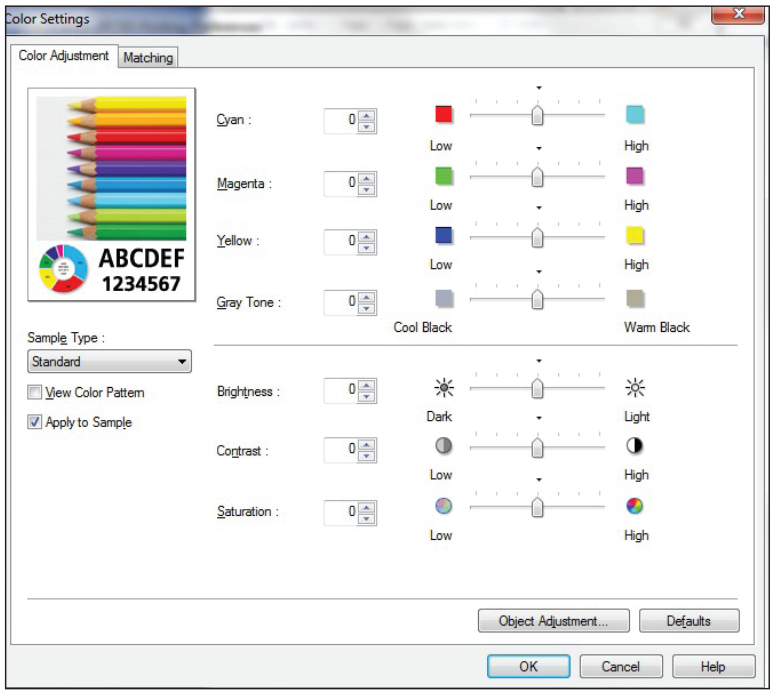
Canon Driver Page Setup Tab



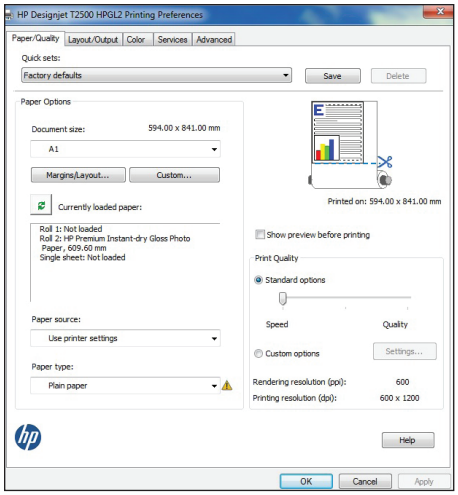
Canon Driver Layout Tab



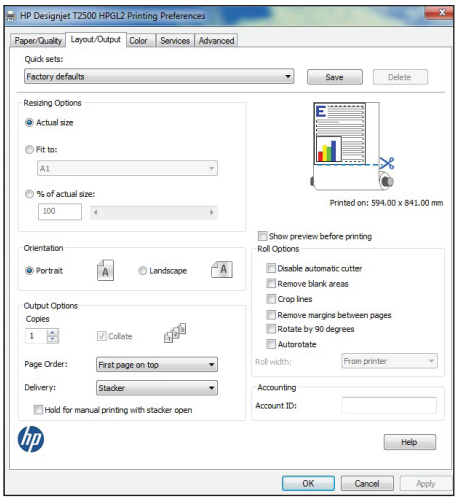
Canon Print Driver Favourites Tab



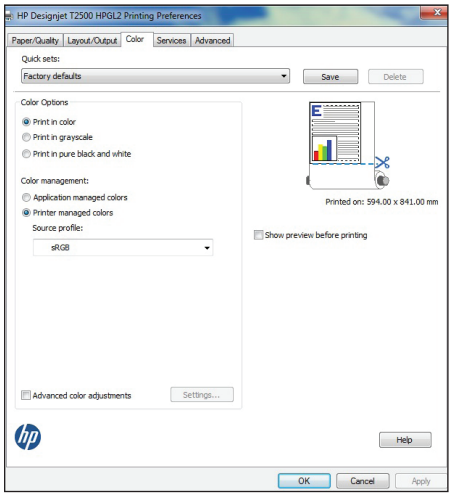
Canon Colour Adjustment Settings



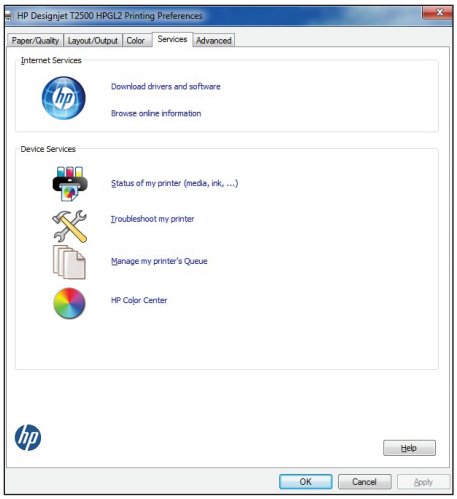
HP T2500 HPGL2 Paper/Quality Tab



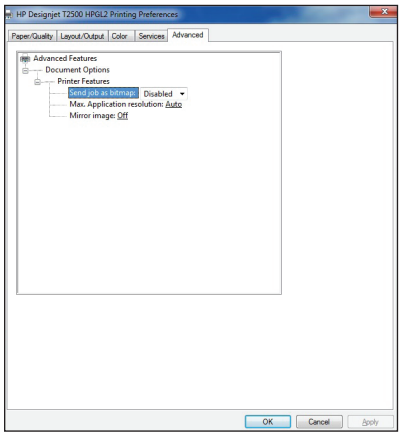
HP T2500 HPGL2 Layout/Output Tab



HP T2500 HPGL2 Colour Tab



HP T2500 HPGL2 Services Tab



HP T2500 HPGL2 Advanced Tab

SUPPORTING TEST DATA

Print Productivity

Job Stream Productivity

Mixed File Types, Same Size

Canon iPF785 MFP (time in seconds)		HP Designjet T2500 eMFP (time in seconds)		Canon % Faster/Slower (-) than HP
Draft	707.24	Fast	690.50	-2.42%
Standard	1,281.75	Normal	1,685.74	23.97%
High	1,957.26	Best	4,186.86	53.25%

BLI's job stream consists of 10 files, including PDF, TIFF and DWF files totalling 19 pages, all at Arch D-size. 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.

Colour Multi-Page Productivity

Canon imagePROGRAF iPF785 MFP (time in seconds)		HP Designjet T2500 eMFP (time in seconds)		Canon % Faster/Slower (-) than HP
Draft	367.61	Fast	410.28	10.40%
Standard	593.29	Normal	983.72	39.69%
High	1,144.18	Best	2,360.45	51.53%

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 with each file set to auto-rotate to save media. 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

Canon imagePROGRAF iPF785 MFP (time in seconds)		HP Designjet T2500 eMFP (time in seconds)		Canon % Faster/Slower (-) than HP
Draft	390.28	Fast	416.13	6.21%
Standard	607.30	Normal	961.03	36.81%
High	1,154.16	Best	2,337.57	50.63%

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, greyscale, black ink only. Both devices were loaded with 914 mm rolls, with each file set to auto-rotate to save media. 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

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)	Canon % Faster/Slower (-) than HP
Time Before Printing Commences	49.19	56.57	13.05%
First Page Out	89.22	120.77	26.12%

First-Page-Out Productivity From Ready State

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)	Canon % Faster/Slower (-) than HP
Time Before Printing Commences	19.47	16.79	-15.96%
First Page Out	59.87	79.30	24.50%

First-page-out times are obtained by sending an Arch D-size PDF file to print, 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, greyscale, black ink only. Both devices were loaded with 914-mm rolls, with each file set to auto-rotate to save media.

A0 First-Page-Out and Throughput Productivity

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)	Canon % Faster/Slower (-) than HP
First Page Out	107.81	143.79	25.02%
Five Pages Out	501.34	735.67	31.85%
Speed per page without processing	98.38	147.97	33.51%

First-page-out times are obtained by sending an Arch D-size PDF file to print, 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, greyscale, black ink only. Both devices were loaded with 914-mm rolls, with each file set to auto-rotate to save media.

Copy Productivity

A1 (Landscape) First-Copy-Out Productivity: Fast mode

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)
Mono	47.2	48.9
Greyscale	47.9	47.9
Colour	56.7	57.3

The single-page A1 (L) document was set to copy at 300-dpi scan resolution with copy settings left in default mode, with the exception of document size, which was set to A1 (Landscape). Print settings were set to Fast mode. Times were recorded from scan initiation to page exiting.

A1 (Landscape) First-Copy-Out Productivity: Standard/Normal mode

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)
Mono	63.7	63.5
Greyscale	67.0	52.2
Colour	77.3	75.0

The single-page A1 (L) document was set to copy at 300-dpi scan resolution with copy settings left in default mode, with the exception of document size, which was set to A1 (Landscape). Print settings were set to Standard/Normal. Times were recorded from scan initiation to page exiting.

A1 (Landscape) First-Copy-Out Productivity: Best mode

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)
Mono	102.5	220.2
Greyscale	137.9	216.8
Colour	185.9	234.1

The single-page A1 (L) document was set to copy at 300-dpi scan resolution with copy settings left in default mode, with the exception of document size, which was set to A1 (Landscape). Print settings were set to Best mode. Times were recorded from scan initiation to page exiting.

A0 First-Copy-Out Productivity: Fast mode

	Canon imagePROGRAF iPF785 MFP (time in seconds)	**HP Designjet T2500 eMFP (time in seconds)**
Mono	67.7	83.3
Greyscale	74.5	78.1
Colour	94.0	98.3

The single-page A0 document was set to copy at 300dpi scan resolution with copy settings left in default mode, with the exception of document size which was set to A0. Print settings were set to Fast mode. Times were recorded from scan initiation to page exiting.

A0 First-Copy-Out Productivity: Standard/Normal mode

	Canon imagePROGRAF iPF785 MFP (time in seconds)	**HP Designjet T2500 eMFP (time in seconds)**
Mono	99.3	99.4
Greyscale	111.6	95.1
Colour	131.2	126.3

The single-page A0 document was set to copy at 300dpi scan resolution with copy settings left in default mode, with the exception of document size which was set to A0. Print settings were set to Standard/Normal mode. Times were recorded for scan initiation to page exiting.

A0 First-Copy-Out Productivity: Best mode

	Canon imagePROGRAF iPF785 MFP (time in seconds)	HP Designjet T2500 eMFP (time in seconds)
Mono	202.9	425.9
Greyscale	271.3	424.1
Colour	357.1	458.6

The single-page A0 document was set to copy at 300dpi scan resolution with copy settings left in default mode, with the exception of document size which was set to A0. Print settings were set to Best mode. Times were recorded for scan initiation to page exiting.

Scan Productivity

Batch Scanning Productivity

Batch Throughput Speed A1 (Landscape) Time in seconds to scan 10 pages

	Canon imagePROGRAF iPF785 MFP (time in seconds)		HP Designjet T2500 eMFP (time in seconds)	
	Scan Time (seconds)	A1 (L) Pages/Hour	Scan Time (seconds)	A1 (L) Pages/Hour
Black 200 dpi	155.9	230.9	NA*	NA*
Black 300 dpi	159.1	226.3	NA*	NA*
Grey 200 dpi	144.9	248.4	NA*	NA*
Grey 300 dpi	149.2	241.3	NA*	NA*
Full Colour 200 dpi	206.6	174.2	NA*	NA*
Full Colour 300 dpi	248.6	144.8	NA*	NA*

* Batch Scanning is not supported by the HP device.

The 10-page A1 (L) document was scanned in batch mode with devices left in default mode, with the exception of document size, which was set to A1 (Landscape), and colour mode and resolution option changes as reflected in the table above. Applications were set to save jobs as PDFs on the test PC with auto-naming enabled. Timing was taken from initiation to when the final page exited the scanner.

A1 Single-Page Scanning Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP	Canon % Faster/Slower (-) than HP
	Scan Time (seconds)	Scan Time (seconds)	
Black 200 dpi	8.0	17.0	52.88%
Black 300 dpi	8.9	31.1	71.35%
Grey 200 dpi	8.1	12.4	34.78%
Grey 300 dpi	9.2	21.4	57.09%
Full Colour 200 dpi	15.1	22.1	31.74%
Full Colour 300 dpi	18.7	41.4	54.83%

The single-page A1 document was scanned with devices left in default mode, with document size set to A1 (Landscape) and colour mode and resolution option changes as reflected in the table above. Applications were set to save jobs as PDFs on the test PC with auto-naming enabled. Each test was conducted twice and an average reading reported. Timing was taken from initiation to when the page exited the scanner.

A1 Single Page Scan to Desktop Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP	Canon % Faster /Slower (-) than HP
	Scan Time (seconds)	Scan Time (seconds)	
Black 200 dpi	8.0	19.8	59.53%
Black 300 dpi	10.4	34.1	69.64%
Grey 200 dpi	8.1	15.7	48.44%
Grey 300 dpi	10.5	25.1	58.16%
Full Colour 200 dpi	14.9	26.3	43.28%
Full Colour 300 dpi	19.2	47.4	59.47%

The single-page A1 document was scanned with devices left in default mode, with document size set to A1 (Landscape) and colour mode and resolution option changes as reflected in the table above. Applications were set to save jobs as PDFs on the test PC with auto-naming enabled. Each test was conducted twice and an average reading reported. Timing taken from initiation to the page being accessible at the desktop.

A0 Single Page Scanning Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP	Canon % Faster /Slower (-) than HP
	Scan Time (seconds)	Scan Time (seconds)	
Black 200 dpi	10.1	27.7	63.52%
Black 300 dpi	11.9	54.0	77.98%
Grey 200 dpi	10.1	20.8	51.47%
Grey 300 dpi	11.9	39.3	69.74%
Full Colour 200 dpi	26.5	38.6	31.38%
Full Colour 300 dpi	31.0	72.2	57.04%

The single-page A0 document was scanned with devices left in default mode, with document size set to A0 and colour mode and resolution option changes as reflected in the table above. Applications were set to save jobs as PDFs on the test PC with auto-naming enabled. Each test was conducted twice and an average reading reported. Timing was taken from initiation to the page exiting the scanner.

A0 Single Page Scan to Desktop Productivity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP	Canon % Faster /Slower (-) than HP
	Scan Time (seconds)	Scan Time (seconds)	
Black 200 dpi	10.6	30.8	65.55%
Black 300 dpi	13.8	56.6	75.63%
Grey 200 dpi	10.9	24.2	54.95%
Grey 300 dpi	14.9	43.1	65.34%
Full Colour 200 dpi	23.1	42.8	46.08%
Full Colour 300dpi	32.0	79.7	59.85%

The single-page A0 document was scanned with devices left in default mode, with document size set to A0 and colour mode and resolution option changes as reflected in the table above. Applications were set to save jobs as PDFs on the test PC with auto-naming enabled. Each test was conducted twice and an average reading reported. Timing was taken from initiation to the page being accessible at the desktop.

Colour Print Quality

Colour Optical Density Evaluation

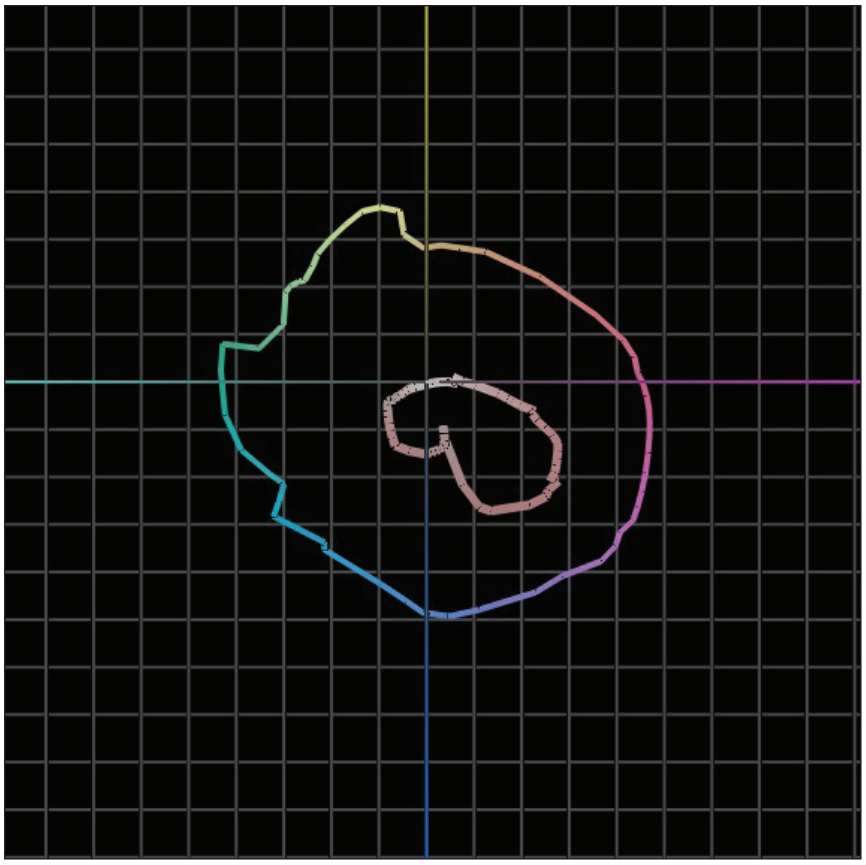
Canon imagePROGRAF iPF785 MFP						
Plain Paper						
	Fast		Standard		High	
	50%	100%	50%	100%	50%	100%
Cyan	0.60	1.04	0.65	1.15	0.61	1.15
Magenta	0.55	0.99	0.63	1.11	0.61	1.13
Yellow	0.45	0.77	0.52	0.88	0.51	0.89
Black	0.58	1.42	0.70	1.50	0.68	1.48

HP Designjet T2500 eMFP						
Plain Paper						
	Fast		Normal		Best	
	50%	100%	50%	100%	50%	100%
Cyan	0.34	0.82	0.49	1.11	0.59	1.17
Magenta	0.33	0.85	0.43	1.11	0.50	1.14
Yellow	0.29	0.63	0.45	0.85	0.43	0.86
Black	0.41	1.32	0.52	1.49	0.62	1.45

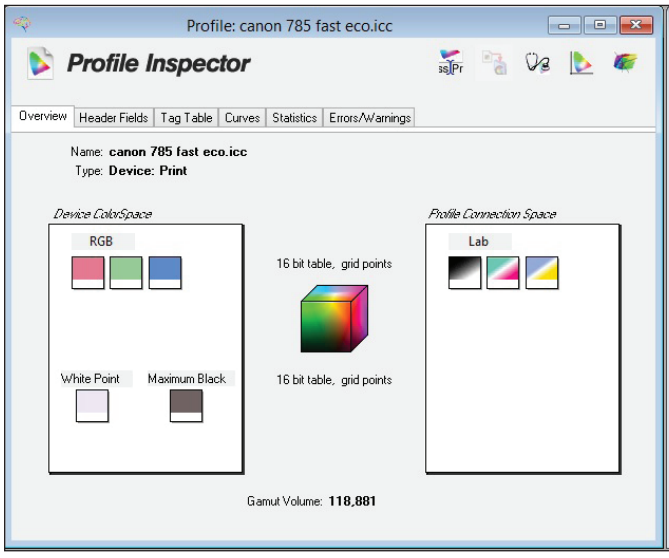
Note: Colour density readings were assessed by printing an IT8 test file on plain paper in default colour settings at all quality settings available and measuring the density of 100% dot fill and 50% dot fill using an XRite 508 densitometer.

Colour Gamut Comparisons

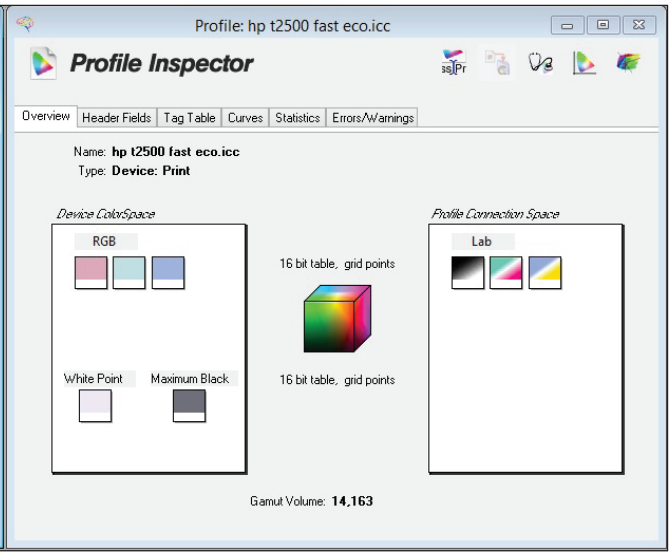
Media Type/Settings	Canon iPF785 MFP	HP Designjet T2500 eMFP	Canon % larger than HP
Plain Paper Fast Economy	118,881	14,163	739.4%
Plain Paper Fast	203,359	95,737	112.4%
Plain Paper Standard	273,359	165,443	65.2%
Plain Paper High	272,598	184,343	47.9%
Coated Best	488,074	415,256	17.5%



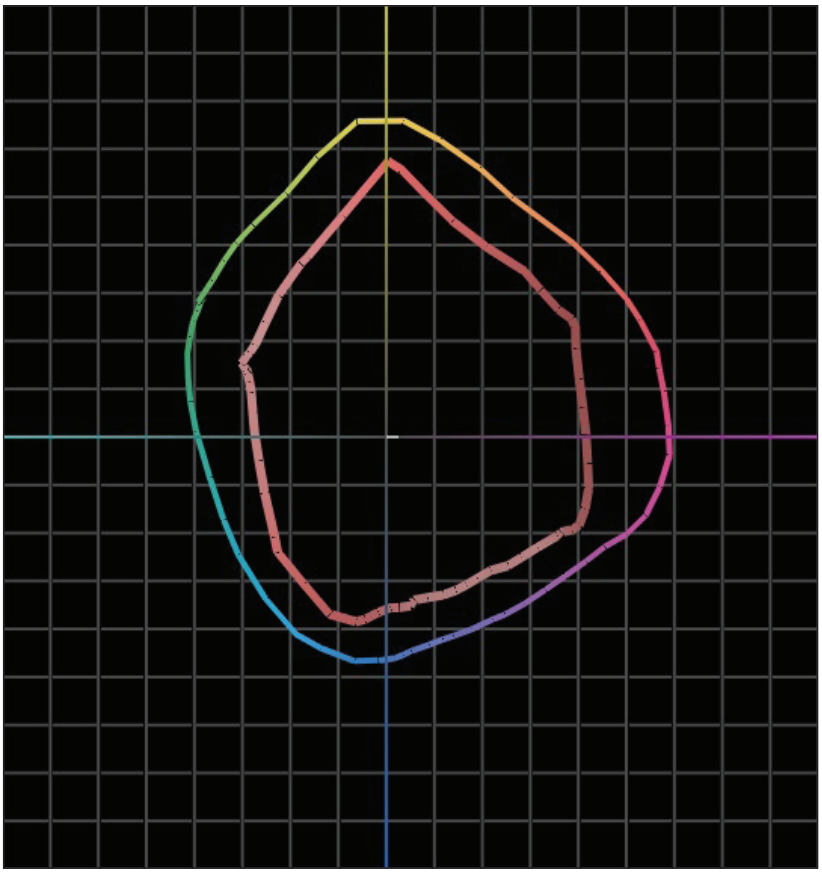
HP Designjet T2500 eMFP colour gamut on plain paper in Fast Economy mode (red) versus Canon imagePROGRAF iPF785 MFP colour gamut (shown chromatically) on plain paper in Fast Economy mode.



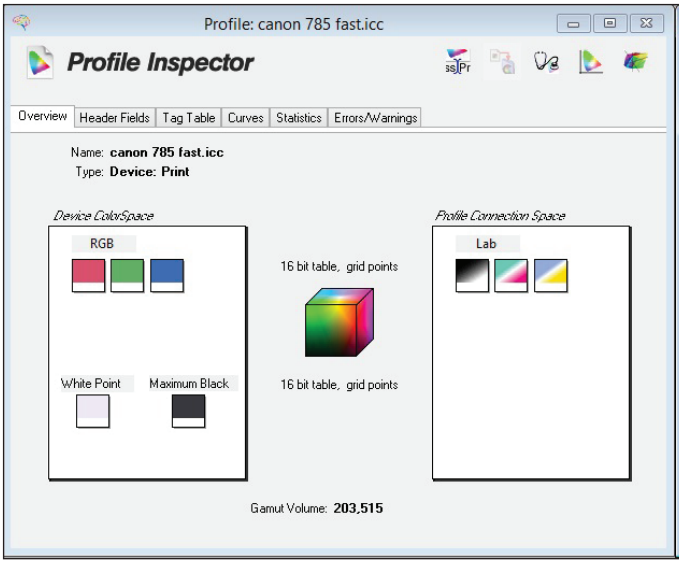
Canon iPF 785 MFP in Fast Economy mode



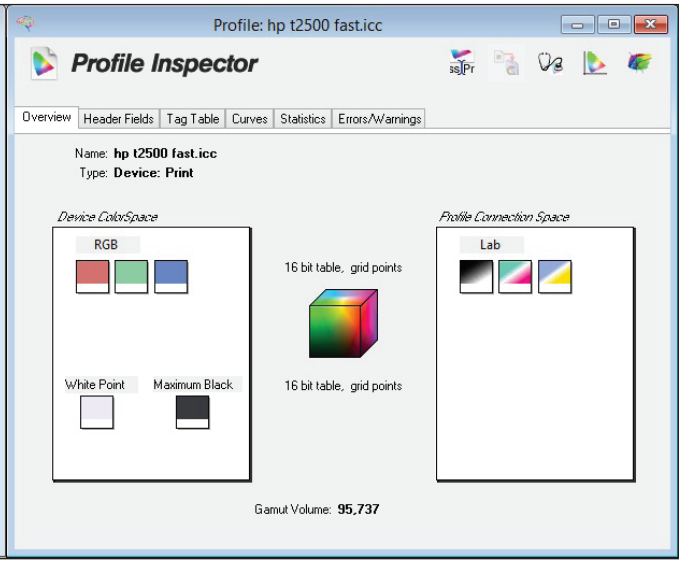
HP Designjet T2500 eMFP in Fast Economy mode



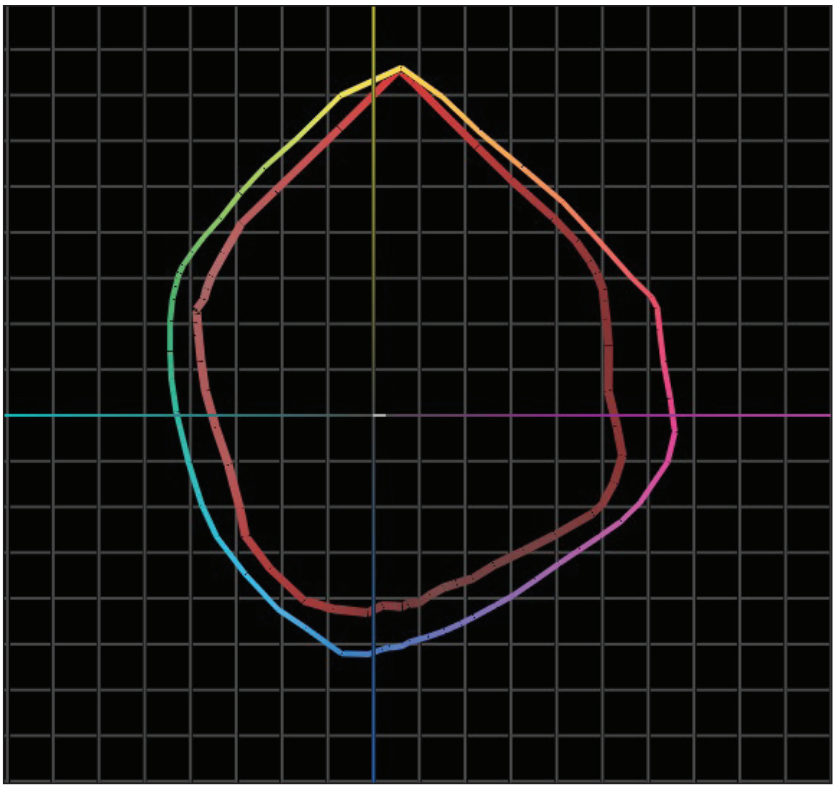
HP Designjet T2500 eMFP colour gamut on plain paper in Fast mode (red) versus Canon imagePROGRAF iPF785 MFP colour gamut (shown chromatically) on plain paper in Fast mode.



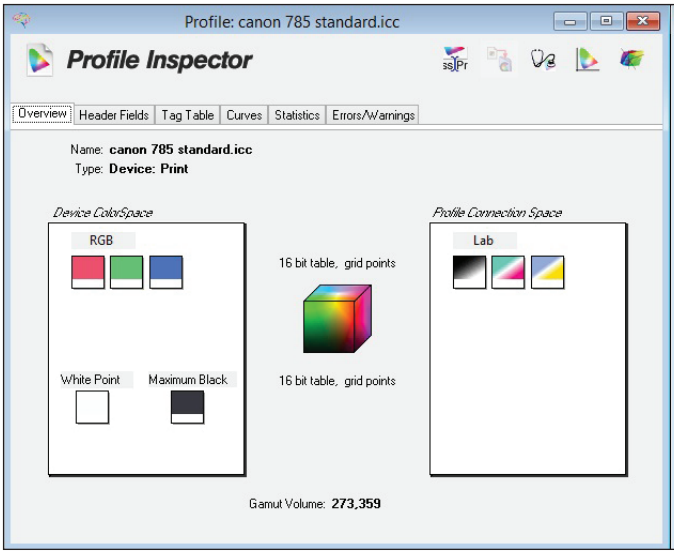
Canon iPF 785 MFP on plain paper (Fast mode)



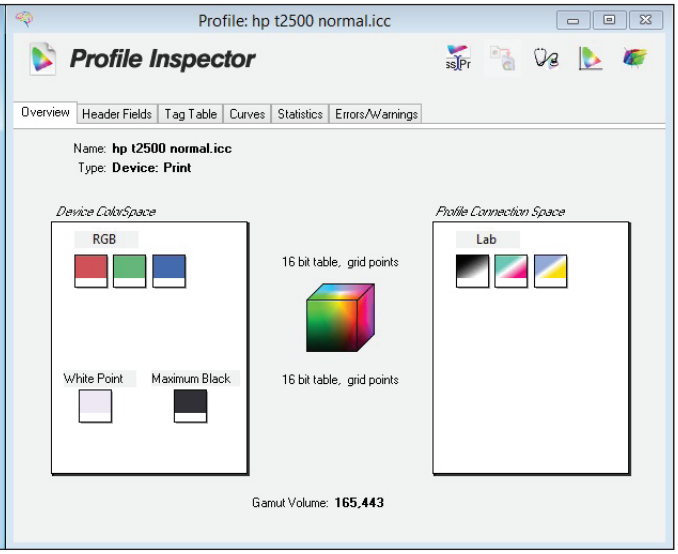
HP Designjet T2500 eMFP on plain paper (Fast mode)



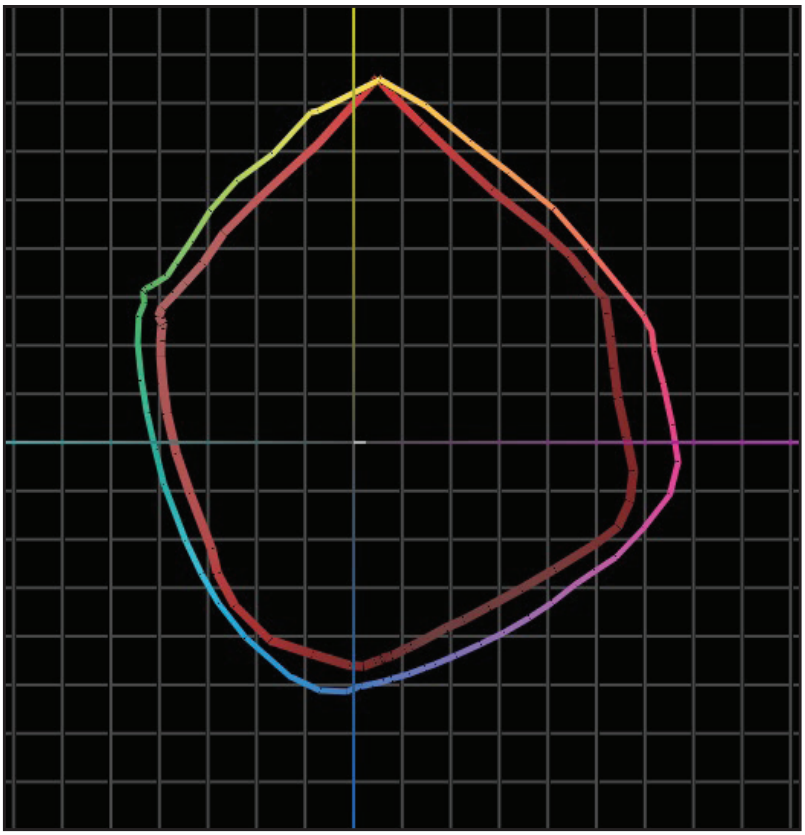
HP Designjet T2500 eMFP colour gamut on plain paper in Normal mode (red) versus Canon imagePROGRAF iPF785 MFP colour gamut (shown chromatically) on plain paper in Standard mode.



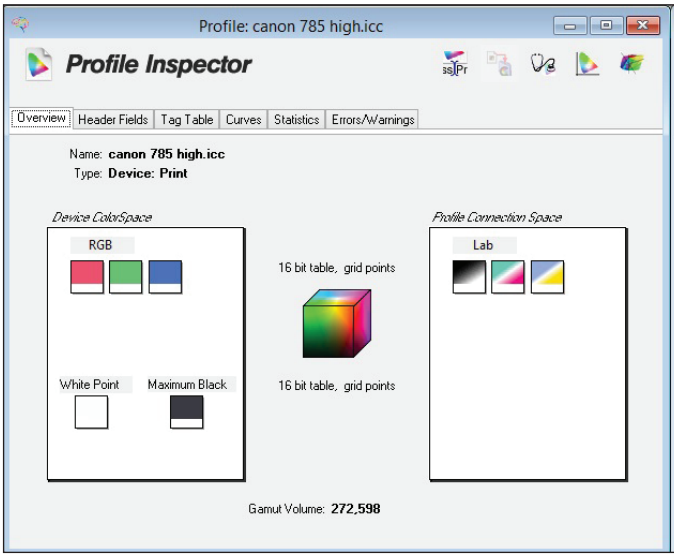
Canon iPF 785 MFP on plain paper (Standard mode)



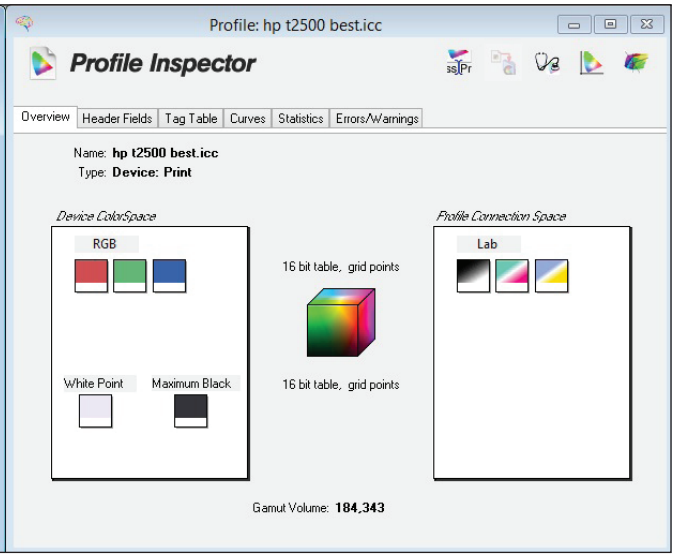
HP Designjet T2500 eMFP on plain paper (Normal mode)



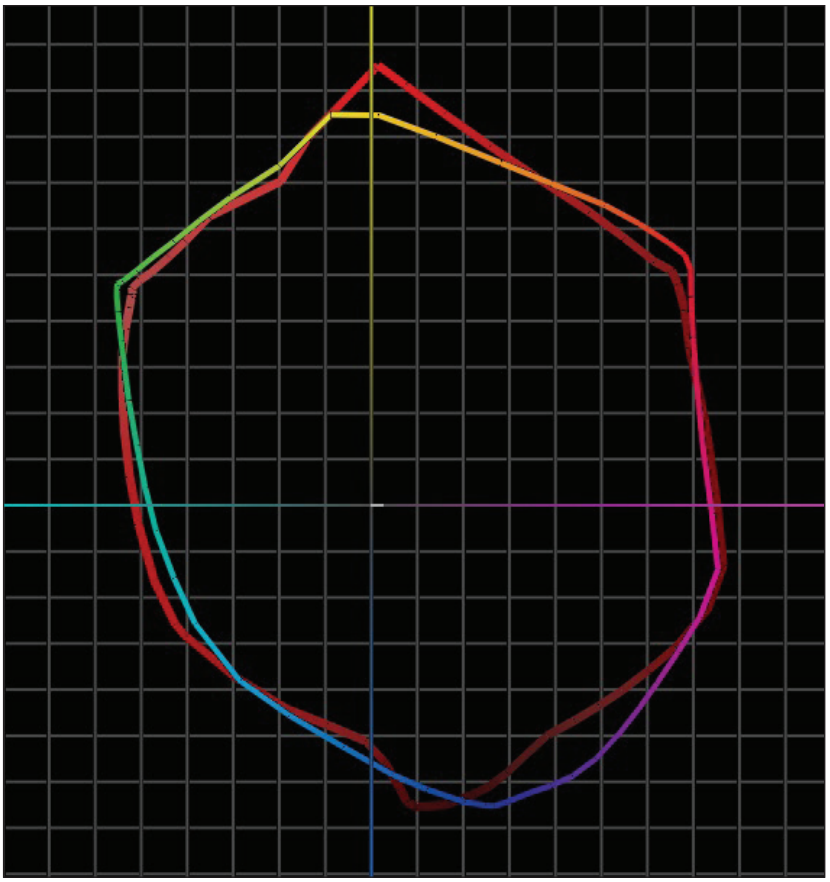
HP Designjet T2500 eMFP colour gamut on plain paper in Best quality settings (red) versus Canon imagePROGRAF iPF785 MFP colour gamut (shown chromatically) on plain paper in High quality settings.



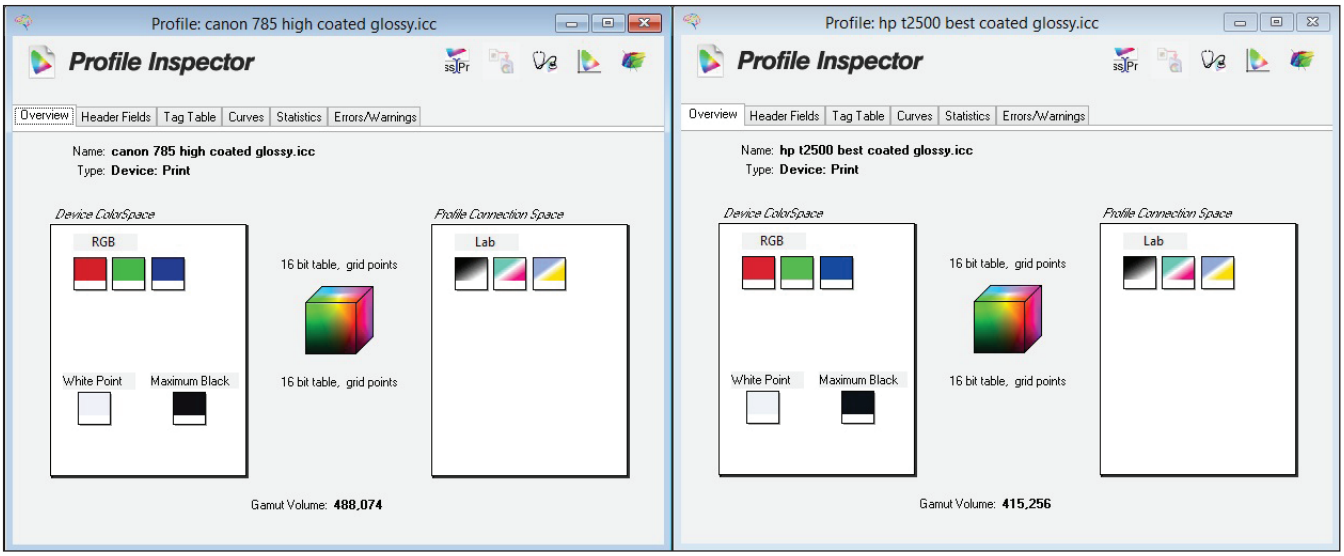
Canon iPF 785 MFP on plain paper, High quality setting



HP Designjet T2500 eMFP on plain paper, Best quality setting



HP Designjet T2500 MFP colour gamut on glossy photo quality paper in Best quality settings (red) versus Canon imagePROGRAF iPF785 MFP colour gamut (shown chromatically) on glossy photo quality paper in High quality settings.



Canon iPF 785 MFP on photo quality paper

HP Designjet T2500 eMFP on photo quality paper

Black Print Quality

Solid Density

	Canon imagePROGRAF iPF785 MFP			HP Designjet T2500 eMFP		
	Draft	Standard	High	Fast	Normal	Best
Density Block						
1	1.39	1.46	1.42	1.40	1.41	1.43
2	1.41	1.44	1.40	1.39	1.39	1.43
3	1.39	1.46	1.43	1.37	1.38	1.44
4	1.41	1.46	1.44	1.38	1.38	1.43

Note: Solid black density measurements are based on four readings taken from a BLI 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, greyscale, black ink only. Density was measured using an XRite 508 densitometer.

Copy Quality

Solid Density

	Original Target	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Cyan	1.30	0.77	1.06
Magenta	1.36	0.94	1.12
Yellow	0.89	0.63	0.85
Black	1.78	1.16	1.37

Note: Solid density measurements in normal/colour copy mode based on copying a Katun test original containing blocks of all solid colours (based on an average of two readings for each colour) printed on plain paper. Density was measured using an XRite 508 densitometer.

Colour Fidelity

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Mc Donalds	12.4	3.3
Coca Cola Red	26.1	19.1
FedEx Blue	17.5	9.8
Fed Ex Green	15.7	13.5
Microsoft	7.1	7.8
Sun Microsystems	11.5	3.5
Ikea Blue	15.3	11.2
Ikea Yellow	24.5	11.5
Time Fortune 500	23.1	14.0
Quark	14.7	9.1
Versonic	19.6	13.3
T-Mobile Red	14.3	8.1
AVERAGE	16.8	10.4

BLI's Pantone test chart was used for Image Quality testing, with High/Best quality settings using 24-bit colour in the case of both models. Delta E measurements recorded the accuracy with which 12 Pantone colours were reproduced.

Dimensional Accuracy

	Canon imagePROGRAF iPF785 MFP	HP Designjet T2500 eMFP
Variation in line length in mm (scanned in landscape)	0.1	0
Variation in line length in mm (scanned in portrait)	0.1	0.2

Dimensional Accuracy was determined using the Applied Images QA-1 Test Chart (150 mm line length) and the Adobe Photoshop Measuring Tool. Charts were scanned in both Portrait and Landscape mode using the highest resolution available (1200 and 600 dpi) with both devices set to Line, B & W mode, and saved as TIFF files.

Device Feature Set

	Canon imagePROGRAF iPF785 MFP	Advantage		HP Designjet T2500 eMFP
User Interface	22" Touchscreen LCD	✔		4.3" Touchscreen LCD
Scanner Features				
Optical resolution (dpi)	1200	✔		600
Scanning resolution (dpi)	100, 200, 300, 400, 600, 1200	✔		200, 300, 600
Colour Scanning Speed	7.62 cm (3")/sec. (200 dpi/24-bit)	✔		3.81 cm (1.5»)/sec. (200 dpi), 1.5 cm/sec. (300 dpi)
Black Scanning Speed	33.0 cm (13")/sec. (200 dpi/24-bit)	✔		11.43 cm (4.5»)/sec. (200 dpi), 4.5 cm/sec. (300 dpi)
Scanning Mode	24-bit RGB Colour, 8-bit Greyscale, 1-bit Black & White			24-bit RGB Colour, 8-bit Greyscale, 1-bit Black & White
Max. Document Size	1,067 mm x 15,000mm	✔		914 mm x 15,000 mm
Max. Scanning Width	1,016 mm (40")	✔		914 mm (36")
Max. Thickness of Paper (mm)	2.0 (with rear exit paper path)	✔		0.8
Paper Path	Front (U-turn or switch-back), rear (straight)	✔		Rear exit (must be rewound to the front to eject from the scanner)
File Save Formats	TIFF, JPEG, PDF	✔		TIFF, JPEG (PDF only with PostScript model)
File Saving Area	Network folder, USB memory, HDD (controller PC)	✔		Network folder, USB memory, HDD (optional)
Preset Document Types	Colour Mixed, Colour Photo, Colour Graphics, Colour Lines, Grey Photo, Grey Lines, B & W, B & W Background Removal 1-3	✔		Line, Mixed, Image
Ability to Save Custom Presets	Yes	✔		No
Background Removal	Yes (in preview edits)			Yes
Preview Scaling	Yes (Linear)	✔		Yes (only 2 size variations)
Deskew	Yes (Manual)		✔	Yes (Auto)
Preview Editing	Yes (Skew, Crop, Brightness, Sharpen, Black Point, White Point, Mirror, Invert)	✔		No
Scan Speed Adjustment	Yes	✔		No
Batch Scanning	Yes	✔		No
Scan to Email	Yes			Yes
Auto Paper Size Detection	Yes			Yes
Rename and Save	Yes	✔		No
Printer Features				
Max. print quality	2400 x 1200 dpi			2400 x 1200 dpi
Number of inks	5		✔	6
Ink tanks replaceable during operation	Yes	✔		No
Ink-drop size	4 picoliter	✔		6 picoliter (C, M, Y, PK, G), 9 picoliter (MBK)

	Canon imagePROGRAF iPF785 MFP	Advantage		HP Designjet T2500 eMFP
Ink cartridge capacity	MBK, BK,CMY 300/130 ml	✔		Mk: 300/69 ml, CMY. PK, G: 130/40 ml
Starter Ink (total)	490 ml	✔		269 ml
Number of nozzles	MBK: 5,120 nozzles, Other colours: 2, 560 nozzles each; 15,360 in total	✔		9,632 nozzles in total
Number of printheads	1(User-replaceable)			1 (User-replaceable)
Max. Paper Width	914 mm (36")			914 mm (36")
Line accuracy	+/-0.1% or less			+/-0.1%
Minimum line width	0.02 mm			0.02 mm
Minimum print margins	3 mm	✔		5 mm
Borderless (0 mm) printing	Yes			Yes
Number of paper rolls	1		✔	2
Maximum outside diameter of roll paper	150 mm	✔		135 mm
Maximum cut-sheet media length	1.6 m	✔		1.5 m
Maximum media thickness	0.8mm	✔		0.5mm
Media loading	Front			Front
Optional media handling	Roll holder set	✔		None
Standard RAM	32 GB		✔	128GB
Maximum RAM	32 GB		✔	128GB
Hard drive	320 GB			320 GB
Interface	10/100/1000Base-TX, USB 2.0	✔		10/100/1000Base-T
PDL	GARO, HP-GL/2, HP RTL			HP-GL/2, HP RTL, HP PCL 3, GUI
Net weight (unpacked)	117 kg			112 kg
Power consumption when in standby	0.5 W	✔		< 4 W
Power consumption when active	140 W		✔	< 120 W
Acoustic pressure, active	48 dB(A)		✔	47 dB(A)
Acoustic pressure, standby	35 dB(A)	✔		39 dB(A)
Acoustic power, active	6.5 B(A)			6.5 B(A)
Acoustic power, standby	INA			5.8 B(A)

Driver Feature Set

	Canon imagePROGRAF iPF785 MFP	Advantage		HP Designjet T2500 eMFP
Speed settings	5 (Fast 300, Fast 600, Standard 600, High 600 and High 1200)	✔		3 (Fast, Normal, Best)
Economy mode	Yes			Yes
Predefined profiles	7 default (Poster, CAD colour and mono, GIS Perspective, Photo, Office Doc, Faithful Colour Reproduction	✔		5 (Default, CAD, GIS, Photo, B/W Photo)
Overview of profile settings provided	Yes	✔		No
Media profiles	44 + 5 user-definable	✔		23
IQ optimized for options	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			Yes, 2 to 16
Poster print mode	Yes (2 by 2)			Yes (2 by 2)
Page stamping	Yes (Date, Time, Name, Page Number)	✔		No
Image rotation	Yes – auto 90 or 180 degrees			Yes – auto 90 degrees
Option to preview before print	Yes			Yes
Link to device Web server from driver	No (there is a link to Status Monitor)			No
CMY balance adjustment	Yes			Yes
Brightness adjustment	Yes			Yes
Contrast adjustment	Yes	✔		No
Saturation adjustment	Yes	✔		No
Advanced colour management options	Yes			Yes
Enlargement Copy Mode	Yes (5 to 600)		✔	Yes (25 to 1,000)
Free Layout Capability	Yes	✔		No
MS Office Plug-in	Yes	✔		No
Accounting Capability	Yes			Yes
Disable automatic cutter	Yes			Yes
Unidirectional printing	Yes	✔		No
Integration with MFP	Yes			Yes

iPF785MFP also offers PosterArtist Lite as bundled software

Test Environment

Testing was conducted in BLI's European test lab, in an atmospherically controlled environment monitored by a 24/7 ExTech RH520 Temperature/RH chart recorder, ensuring that typical office conditions were maintained. All paper used in testing was allowed to acclimatize inside the facility for a minimum of 12 hours before being used.

Test Equipment

Test equipment: BLI's dedicated test network in Europe, consisting of Windows 2008 servers, Windows 7 workstations, 10/100/1000BaseTX network switches and CAT5e/6 cabling.

Test Procedures

The test methods and procedures employed by BLI in its lab testing include BLI's proprietary procedures and industry-standard test procedures. In addition to a number of proprietary test documents, BLI uses industry standard files including an IT8 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 is evaluated using a profile software tool from Colour Confidence that was read using an EFI ES-1000 colour spectrophotometer and analysed using Chromix ColorThink Pro 3.0 software. Density of black and colour output was measured using an X-Rite 508 densitometer.

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