

## BLI Comparative Performance Evaluation

NOVEMBER 2014

**Canon imagePROGRAF iPF6400SE vs.  
Epson SureColor SC-T3200**

Canon imagePROGRAF iPF6400SE



Epson SureColor SC-T3200

	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Advantage ✓		
Colour Image Quality	✓	
Black Image Quality	=	=
Print Productivity	✓	
Direct PDF Print Submission Functionality	✓	
Banner Printing	✓	
Ink Consumption	✓	
Device Feature Set		✓
Print Driver Feature Set	✓	
Printhead Reliability / Cleaning Routines	✓	

## TEST OBJECTIVE

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Buyers Laboratory LLC (BLI) was commissioned by Canon Europe to conduct confidential document imaging device performance testing on the Canon imagePROGRAF iPF6400SE and the Epson SureColor SC-T3200, and produce a report comparing the relative strengths and weaknesses of the two products in terms of image quality, productivity, direct PDF print functionality, banner and poster printing, ink consumption, device feature set, driver functionality, cleaning routines and issues with printhead clogging. All testing was performed in BLI's test facility in Wokingham, UK.

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## Executive Summary

The Canon imagePROGRAF iPF6400SE gave an outstanding performance across the board in BLI's testing, outperforming the Epson SureColor SC-T3200 in most aspects of testing. Offering a clear speed advantage over its Epson rival in BLI's productivity tests, the iPF6400SE delivered the faster first-page-out times from ready state in all modes and excelled with its throughput speeds (eliminating the first page impact), particularly in High/Max Quality. The Canon model took just 7 minutes and 0.58 seconds to print a single A1 portrait photo, compared with nearly twice that—15 minutes and 5.33 seconds—for the Epson SC-T3200. Another significant advantage is that Canon's hot-swap ink tanks enable users to replace empty inks while actively printing, without having a negative impact on productivity.

Aimed at the Graphic Arts (poster/signage) market, both models delivered exceptional image quality, with dark, crisp fonts, distinct fine lines, smooth circles and excellent colour stability. While the Epson model delivered higher optical densities for black and yellow, the Canon model produced superior colour image quality overall. It offers a larger colour gamut when printing on matte coated paper—17.35% larger than the Epson model's—and smoother halftone fills. In addition, the Canon iPF6400SE produced better photographic output, with finer light/dark contrast definition and better colour saturation, as well as more consistent and natural-looking flesh tones, which were bluish in output produced by the Epson unit in Max Quality mode.

The Canon model also performed better in terms of ink consumption, using significantly less ink than the Epson SC-T3200 when printing 50-page runs of two test documents in Standard/Quality mode on matte coated and glossy photo stocks. Further contributing to the Canon model's more efficient use of ink is the reliability of its printhead, which did not suffer any problems with nozzle clogging when powered off over a weekend. Conversely, when the Epson model was shut down over a weekend, and even for shorter periods, it experienced issues with nozzle clogging, which required a cleaning cycle to rectify, leading to added ink consumption.

The Epson SC-T3200 is not without some strong features of its own; it offers a more robust device feature set than the Canon model, with 1 GB of RAM (as opposed to 256 MB with the Canon model) and an optional 320-GB hard drive, whereas a hard drive is not available, even as an option, with the Canon unit. The Epson model also has larger cartridges than the Canon model, and uses less energy both while printing (52 W as opposed to 100 W) and in standby mode (3 W versus 5 W for the Canon model). Both devices allow users to integrate with a smaller-format MFP to produce enlarged, poster-size copies—the Canon unit via its free Color imageRUNNER Enlargement Copy Mode, and the Epson unit via its extra-cost CopyFactory Utility.

In conclusion, while both models deliver exceptional image quality overall, the Canon imagePROGRAF iPF6400SE emerged as the stronger performer in BLI's evaluation. It also offers several unique advantages, such as its hot swap ink tanks and Canon's iPF Direct Print & Share, a free utility that can be downloaded from the company's website, which supports direct PDF submission without the need to open an application.

## Colour Image Quality

	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
<b>Advantage ✓</b>		
<b>Text</b>	=	=
<b>Fine Lines</b>	=	=
<b>Halftone Range</b>	=	=
<b>Halftone Fill</b>	✓	
<b>Solid Density</b>	=	=
<b>Colour Drift across FOGRA39</b>	=	=
<b>Consistency of three skin tones</b>	✓	
<b>Business Graphics</b>	✓	
<b>Photographic Images</b>	✓	
<b>Colour Gamut (matte coated paper)</b>	✓	

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

- All image quality testing, with the exception of colour gamut measurement, was done with Canon's own Matte Coated Paper 140-gsm, and Epson's own Double Weight Matte media, with print priority set to Image; quality was set to High on the Canon model (2400 x 1200 dpi), and Max Quality (2880 x 1440 dpi) on the Epson model.
- Both models performed very well under BLI test conditions and delivered an exceptionally high standard of colour output appropriate for their graphics arts target market. There was no banding evident in output produced by either model.
- Each model produced clearly formed, smooth serif and sans serif fonts in colour mode, which were legible down to the 3-point type size with no breakup.
- The Canon iPF6400SE produced the 1x1 pixel grid in CMY with no quality issues, as did the Epson unit.
- Both devices delivered excellent vertical and horizontal fine lines down to the 0.1 size, with no stair-stepping evident. Circles were fully formed.
- + The Canon model delivered an impressive range of halftone fills in all colour modes, with smooth transitions between all levels. Halftones produced by the Epson device were distinct across the full range, however they were less smooth and displayed slight graininess.
- The Canon device produced a higher optical density for cyan, but its optical density for yellow was lower than Epson's, while magenta was an even match between the devices.
- + The Canon model exhibited very good, natural-looking skin tones in photographic images; it produced colours with slightly better saturation and its output showed better definition in light/dark contrast areas. Skin tones produced by the Epson unit displayed a slight cyan bias and lacked detail in light contrast areas.
- + In the skin tone tests, output produced by the iPF6400SE displayed much less variance across two of the three skin shades when compared with output produced by the Epson model.

- During BLI's colour drift analysis, in which the FOGRA39 media wedge is submitted to print before and after productivity and ink consumption tests, and measured using EFI Colour Verifier software, both models delivered impressively low mean Delta E drifts (1.3 for the Canon iPF6400SE and 0.8 for the Epson SC-T3200).
- + The Canon iPF6400SE delivered a larger colour gamut when printing on matte coated paper—17.35% larger than the Epson model's, with a CIE volume of 383,918 versus 327,149 with the Epson device.
- + BLI analysed a wide range of colour output produced by both devices and found business graphics and photographic images to be of very good quality, befitting models aimed at the graphics arts market. Overall, the Canon model produced more vibrant colours with excellent production of fine details in light and dark contrast areas.

## Black Image Quality

	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
<b>Advantage ✓</b>		
<b>Text</b>	=	=
<b>Fine Lines</b>	=	=
<b>Halftone Range</b>	=	=
<b>Halftone Fill</b>	✓	
<b>Solid Density</b>		✓
<b>Consistency of neutral grey</b>	✓	
<b>Business Graphics</b>	=	=
<b>Photographic Images</b>	=	=

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

- Each model produced crisp and smooth serif and sans serif fonts in monochrome mode, which were legible down to the 3-point type size with no breakup.
- When printing BLI's line art test target, closely spaced fine lines remained distinct down to the 0.1-pt. level in the output of both devices, with no evidence of stair-stepping in diagonal lines. Both devices delivered distinct white-on-black fine lines at the 0.25-pt. level, while circles were fully formed.
- Both models produced output with consistent dot laydown in black across all 1x1 and 2x2 pixel grids.
- + Neutral grey consistency was maintained slightly better with the Canon model, with a maximum Delta E of 0.5 compared with 0.9 for the Epson device.
- The Epson device delivered an optical density for black that was 6.62% higher than the Canon (1.51 versus 1.61).
- Both models delivered halftone fills across the full range—from the 10% to 100% dot-fill levels.

- + The Canon iPF6400SE's halftone fill results were very good, exhibiting a consistent grey halftone shade throughout the range. However, the Epson unit delivered halftone fills with a magenta and cyan bias which also displayed slight graininess.
- Monochrome business graphics and photographic output from both models were equally good, with excellent production of fine details in light and dark contrast areas.

## Print Productivity

	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
<b>Advantage ✓</b>		
<b>First Page Out From Ready State (Fast/Speed)</b>	✓	
<b>First Page Out From Ready State (Standard/Quality)</b>	✓	
<b>First Page Out From Ready State (High/Max Quality)</b>	✓	
<b>Throughput Speed Portrait Photo (Fast/Speed)</b>	✓	
<b>Throughput Speed Portrait Photo (Standard/Quality)</b>	✓	
<b>Throughput Speed Portrait Photo (High/Max Quality)</b>	✓	
<b>Throughput Speed Retail Poster (Fast/Speed)</b>	=	=
<b>Throughput Speed Retail Poster (Standard/Quality)</b>		✓
<b>Throughput Speed Retail Poster (High/Max Quality)</b>	✓	

- When the Epson SC-T3200 model's ink cartridges are replaced, printing resumes seamlessly from the same point in the page, with no discernible line or break in output and no difference in image quality, so no ink or paper is wasted. The same applies with the Canon device.
- + One factor affecting productivity is that when the Epson SC-T3200 model runs out of ink, printing has to stop for the cartridge to be replaced, leading to operator downtime. In contrast, the Canon model continues to print (drawing ink from its sub-tank) when ink needs replacing, while its control panel conveniently alerts the user to replace ink and provides ink purchasing information.
- When the Canon iPF6400SE runs out of paper, the device pauses and alerts the operator. After a new roll is installed, the operator is prompted to confirm the paper type. The device resumes printing at the beginning of the interrupted page, rather than printing the portion of the page that remained before running out of paper, so less ink and paper is wasted. The Epson SC-T3200 will also print the interrupted page in its entirety after a new roll is installed.
- + When printing a single TIFF portrait photo, the Canon model easily surpassed the Epson model in terms of speed from ready state across all modes. It was 42.1% faster in Fast mode, 51.0% faster in Standard mode and 53.5% faster in Max Quality mode when compared with the Epson SC-T3200.
- + The Canon iPF6400SE also outperformed the Epson model with faster first-page-out times from ready state in all modes when printing a single JPEG retail sale poster. In High/Max Quality mode, the Canon model delivered

the poster in 242.2 seconds, 9.6% faster than the Epson device (267.89 seconds). In Fast mode, it was 8.7% faster and in Standard/Quality mode it was 3.1% faster.

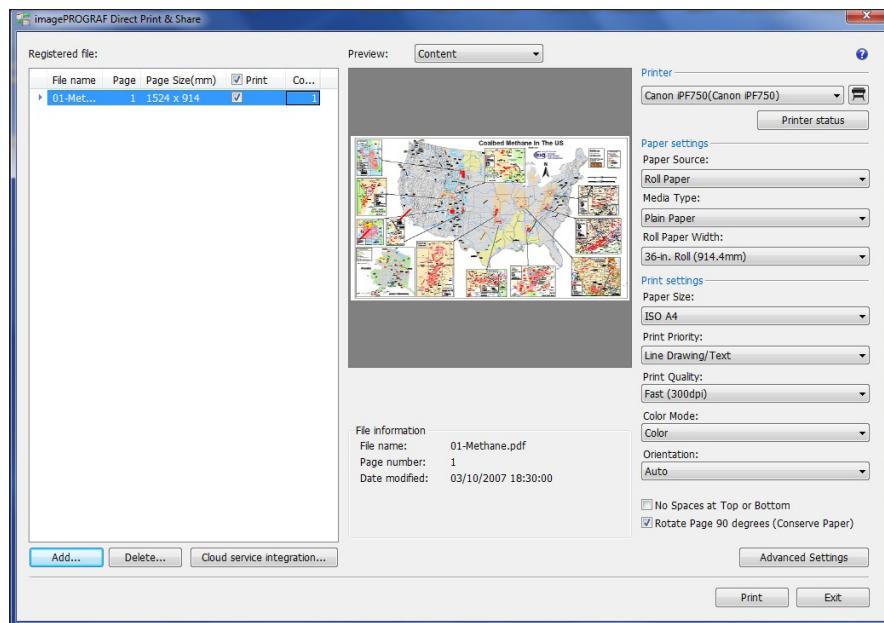
- + When printing five copies of a single-page A1-size TIFF portrait photo test document, the Canon model displayed a clear speed advantage over the Epson model, with a per-page speed that was 37.4% faster in Fast/Speed mode, 49.8% faster in Standard/Quality mode and 55.5% faster in High/Max Quality mode.
- The Epson SC-T3200 printed five copies of a single-page A1-size JPEG retail sale test document in 94.99 seconds in Fast/Speed, comparable with the iPF6400SE's performance of 97.19 seconds.
  - In Standard/Quality mode, the Canon was slightly slower (8.4%) than the Epson unit.
- + However, the Canon iPF6400SE's per-page time when printing five copies of a single-page A1-size JPEG retail sale test document in High/Max Quality mode was 6.2% faster than the Epson model.

## Direct PDF Print Submission Functionality

	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Advantage ✓		
Functionality*		✓

\* BLI did not test Epson's optional, extra-cost PS module, therefore is unable to assess its functionality.

- + 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.
- + The latest version (v2.0) of iPF Direct Print & Share supports "Shortcut Print" functionality which defines the print settings for various jobs represented by a desktop icon. Files are automatically printed with the predefined settings when users drag-and-drop them to the icon. Multiple desktop icons can be created for different combinations of print settings.
- + An optional (extra-cost) PostScript module allows direct and hot-folder batch printing as well as secure PDF printing for Epson users; functionality operates via hot-folder 'drag-and-drop' with configurable job processing options.



**Canon's iPF Direct Print & Share utility**

## Banner Printing

		Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
<b>Advantage ✓</b>			
<b>Image Quality</b>	=	=	
<b>Productivity</b>	✓		

- + Both the Canon iPF6400SE and the Epson SureColor SC-T3200 successfully printed BLI's 24" x 70" banner (originally a 4,955-KB PDF file) in Standard/Quality mode with no quality issues. The Canon model took 22.91 seconds to generate a preview (compared with 24.44 seconds with the Epson model), and a further 5 minutes, 13.64 seconds from preview to final paper cut, compared with 5 minutes, 30.14 seconds for the Epson model.

## Ink Consumption

BLI analysts 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 BLI 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.

RESULTS		
Results averaged across three tests of 50-set A1 printing in Standard/Quality Mode	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
<b>RETAIL POSTER</b>		
Average weight of ink used (grams)	100.4 g	108.9 g
<b>PORTRAIT PHOTO</b>		
Average weight of ink used (grams)	103.9 g	129.2 g

- + In BLI's Retail Poster print runs on matte coated media, the Canon unit used 7.8% less ink, and in the Portrait Photo print runs on Glossy Photo media, the Canon model used 19.6% less ink than the Epson device.

## Device Feature Set

- The capacities of the Canon cartridges (130 ml or 300 ml for black, cyan, magenta and yellow) are lower than those of the Epson model (110 ml, 350 ml and 700 ml), so they will need replacing more frequently than with the Epson device.
- + If the Canon device detects that printhead nozzles are in danger of clogging, it automatically starts a cleaning routine. This task has to be done manually with the Epson unit.
- + Canon's ink cartridges can be replaced during operation, which helps to reduce downtime for Canon users.
- + The Canon unit supports a higher maximum cut-sheet media length of 1.6 m, compared with 914 mm for the Epson unit.
- Both models offer both USB 2.0 connectivity, but the Canon model does not support Gigabit Ethernet.
- The Canon model offers a standard RAM of 256 MB that is not upgradable, while the Epson unit has a non-upgradable standard RAM of 1 GB, plus an optional 320-GB hard drive, which the Canon model doesn't offer.
- + The Canon model is a lighter (54 kg versus 67 kg), more compact unit than the Epson device.
- The Epson model includes a colour LCD; the Canon model offers a monochrome LCD display.

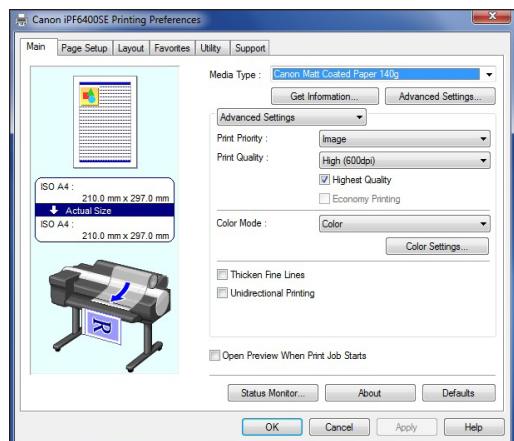
- The Epson SC-T3200's power consumption is lower than the Canon model, both in standby mode (3 watts versus Canon's 5 watts) and while printing (52 watts versus Canon's 100 watts).
- + Rated noise emissions are slightly lower with the Canon model (49 dB) compared to the Epson device (50 dB).
- The Canon model accommodates both 2" and 3" core adapters, which help to avoid excessive paper curling toward the end of the life of a roll—these core adapters are affixed to roll holders placed at each end of a metal shaft (onto which the media roll is placed). The Epson model doesn't require any adapters, as it does not use a shaft; rather, it offers an adjustable holder which fits the core of the roll at each end making it a more seamless solution.
- Both models offer easy and quick roll paper set with auto paper feed—once the user loads paper on to the device, alignment and width adjustments are automatically carried out by the model without further user intervention.
- + The Canon device includes a media mismatch option, which places on hold jobs that can't be printed due to incorrect media being loaded, while jobs that can be completed are printed; the queued jobs are printed once the required paper is loaded. The Epson device does not offer this capability, and continues printing on the mismatched media, which results in ink and media waste.
- + The Canon model includes PosterArtist Lite, Canon's software for creating posters and signage in simple steps. The full version of Canon PosterArtist (available as an option) offers more advanced features such as auto design, variable data printing, in-application editing features, plus additional templates, photos and clip art.
- 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. Epson's LFP Accounting Tool, a free download from Epson's website, offers comparable accounting features.

## Driver Feature Set

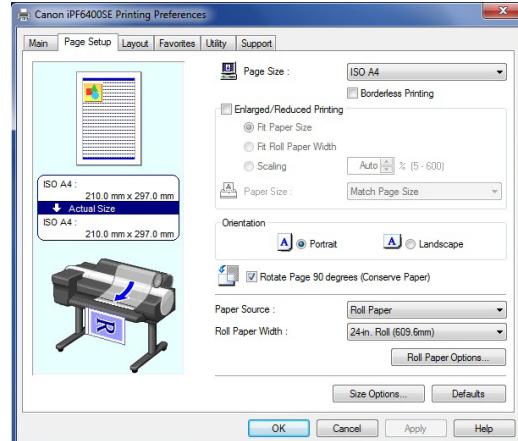
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- + The Canon iPF6400SE has five speed settings (Draft 300, Standard 600, Draft 600, High 600 and 1200), while the Epson device has three settings (Speed, Quality and Max Quality), although not all speed settings are available with all media types.
- Both the Canon GARO driver and the Epson ESC/P driver provide a useful overview of the settings for pre-defined profiles.
  - Five predefined profiles are available with the Canon driver, while the Epson driver offers a wider range of eight predefined profiles.
  - + However, the Canon model offers 42 media profiles compared with 20 for the Epson unit.
  - + The Canon driver supports multi-up (2 to 16) printing, while the Epson driver supports only 2 to 4 multi-up printing.

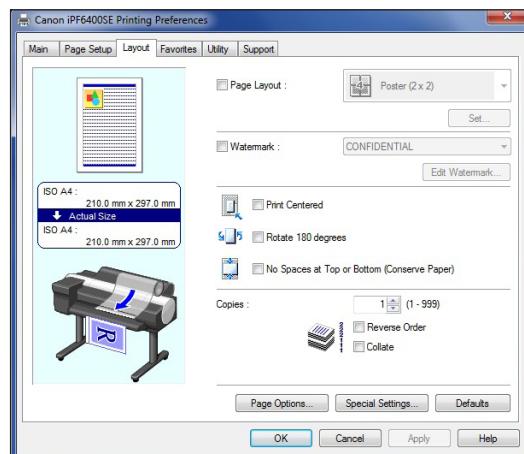
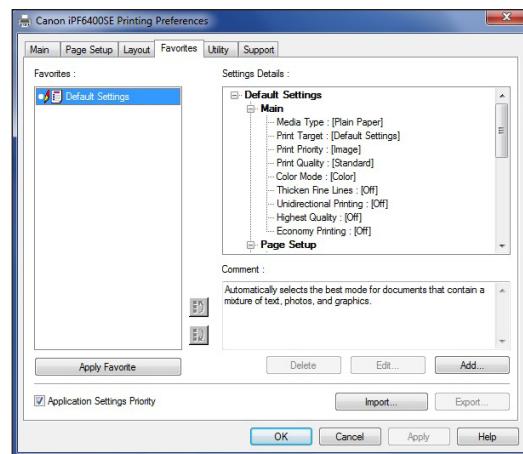
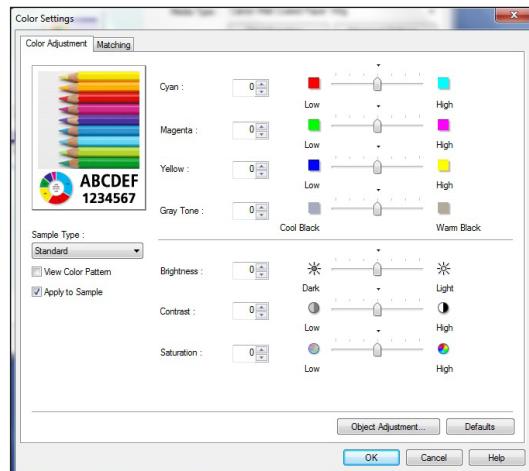
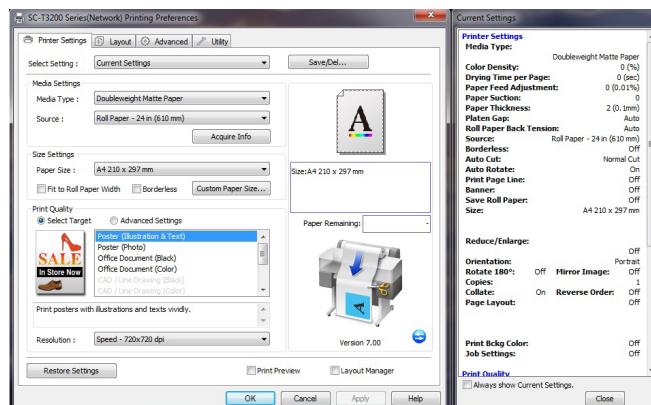
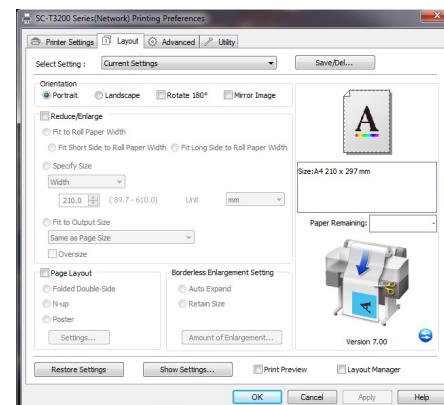
- Both models offer a poster mode: the Canon GARO driver offers a 2 by 2 poster mode, while the Epson driver supports 4 by 4.
- The Canon driver offers page stamping (Date, Time, Name and Page Number); the Epson driver offers a much wider range of options, including all the image quality attributes.
- Both the Epson driver and the Canon GARO driver offer a wide range of built-in adjustments for CMYK balance, brightness, contrast and saturation. ICC profile settings are also available with both drivers—in the case of Canon's GARO driver in the respective tab under Advanced Settings. Canon operators can select four matching modes (driver, ICC, driver ICM and host ICM matching) and one of four rendering methods (auto, perceptual, colorimetric or saturation).
- The Epson model provides a handy thumbnail preview for users to check the effects on the image as they make colour adjustments. In addition, the Epson driver displays a list of all the current settings on each tab window, providing users with a quick, at-a-glance summary.
- + The Canon driver offers unidirectional printing, even in Fast mode. This means that the printhead travels in only one direction to create the desired image, helping to avoid any banding across output. The Epson does not offer this feature, although it exhibited no banding in the image quality evaluation or in the Banner print test.
- + The Canon driver includes the Color imageRUNNER Enlargement Copy Mode utility, which enables users to integrate a Canon small-format MFP device with the iPF6400SE. Documents scanned by the Canon MFP are automatically routed to a hot folder that is monitored by the iPF6400SE's driver. The image is then resized and printed, offering a fast, easy-to-use poster creation tool for office users. Epson users can choose comparable functionality via the extra-cost CopyFactory Utility.
- The Canon driver also includes a Free Layout nesting tool (also available for free download via the Printer Driver Extra Kit) 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, helping to save on paper. Epson also offers resizing functionality and the ability for users to combine multiple documents to print on to a single page via its Layout Manager.
- The Canon model also offers a plug-in for printing from Microsoft Office applications, which provides a wizard that walks users through the process of creating posters for Word, Excel or PowerPoint, and includes useful tools for automatic media resizing, nesting and borderless printing. Epson offers similar software, LFP Print Plug-In for Office, to its users.

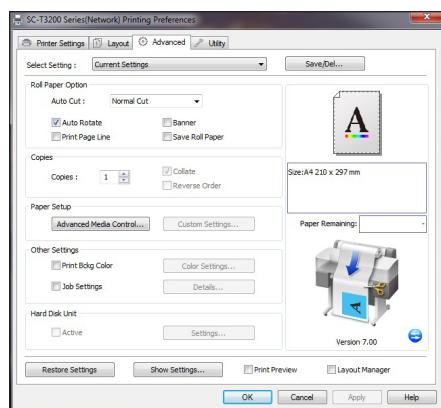
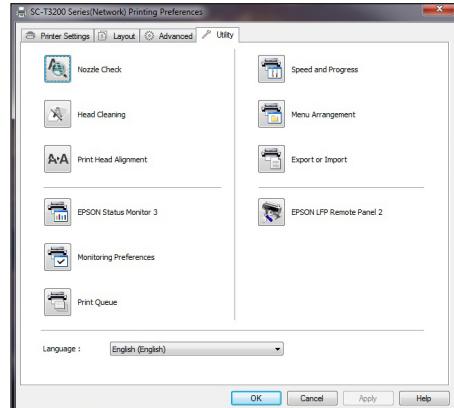
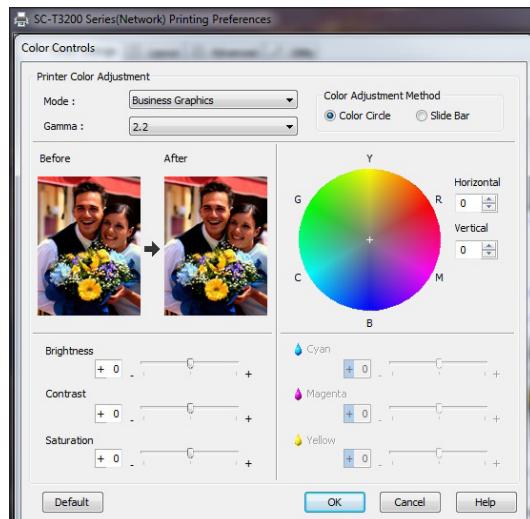


Canon iPF6400SE Print Driver Main Tab



Canon iPF6400SE Print Driver Page Setup Tab


**Canon iPF6400SE Print Driver Layout Tab**

**Canon iPF6400SE Print Driver Favourites Tab**

**Canon iPF6400SE Colour Adjustment Settings**

**Epson Print Driver Printer Settings Tab**

**Epson Print Driver Layout Tab**


**Epson Print Driver Advanced Settings Tab**

**Epson Print Driver Utility Tab**

**Epson Print Driver Colour Controls**

## Printhead Reliability / Cleaning Routines

- Both models offer nozzle-check settings at the control panel. The Canon iPF6400SE offers four fail-safe nozzle check settings at the control panel—Off, 1 page, 10 pages or Standard (the default setting), while the Epson SC-T3200 has settings for Periodic (the default mode), On (Per Job) or Off.
- When it comes to replacing the printhead, the Canon model offers a user-friendly replacement procedure; the Epson model requires a service technician installation, but its printhead is designed to last for the life of the machine.

- + As soon as a clogged nozzle is detected on the Canon unit, an automatic cleaning cycle is triggered to maintain image quality and consistency; this takes place in the background, requiring no user intervention. The Epson model does require user intervention: the control panel alerts users that a cleaning cycle is required, and that they can either opt to wait until a print run has finished, or cancel a print job and run the cleaning cycle immediately.
- + After both devices were shut down completely over the course of a weekend, the Canon model had no problems with nozzles clogging. When a nozzle-check pattern was requested by BLI analysts, it printed with perfect accuracy thereafter. In contrast, the nozzles of the Epson unit became clogged and required a cleaning cycle to resolve the issue, leading to operator downtime. The Canon model is capable of performing a cleaning cycle in the background while the device is in operation.

## SUPPORTING TEST DATA

### Productivity

#### Colour Throughput Time – A1 Portrait Photo Printing

Canon imagePROGRAF iPF6400SE (time in seconds)			Epson SureColor SC-T3200 (time in seconds)		
Fast	Standard	High	Speed	Quality	Max Quality
154.65	269.65	404.89	246.98	537.47	910.39

A single-page A1 portrait TIFF file was printed as a 5-page job using the device driver set to the glossy paper/colour setting. Both devices were loaded with 24" rolls, with each job set to auto-rotate to save media. The time indicated is the average speed per page in seconds (based on timing from the cutting of the first page to the cutting of the final page and dividing by four to exclude the initial processing time).

#### Colour Throughput Time – A1 Retail Sale Poster Printing

Canon imagePROGRAF iPF6400SE (time in seconds)			Epson SureColor SC-T3200 (time in seconds)		
Fast	Standard	High	Speed	Quality	Max Quality
97.19	142.75	253.74	94.99	131.67	270.66

A single-page A1 retail sale JPEG file was printed as a 5-page job using the device driver set to the matte coated paper/colour setting. Both devices were loaded with 24" rolls, with each job set to auto-rotate to save media. The time indicated is the average speed per page in seconds (based on timing from the cutting of the first page to the cutting of the final page and dividing by four to exclude the initial processing time).

#### First-Page-Out Time from Ready State – Portrait Photo Printing

	Canon imagePROGRAF iPF6400SE (time in seconds)			Epson SureColor SC-T3200 (time in seconds)		
	Fast	Standard	High	Speed	Quality	Max Quality
<b>Time Before Printing Commences</b>	13.94	17.40	26.38	10.25	11.05	11.25
<b>First Page Out</b>	146.41	265.93	420.58	252.81	542.41	905.33

First-page-out times are determined by sending an A1 portrait TIFF file to print, timed from job release to page out, with the Canon driver set to the glossy paper setting and the Epson driver set to glossy paper. Both devices were loaded with 24" rolls, with each job set to auto-rotate to save media.

#### First-Page-Out Time from Ready State – Retail Sale Poster Printing

	Canon imagePROGRAF iPF6400SE (time in seconds)			Epson SureColor SC-T3200 (time in seconds)		
	Fast	Standard	High	Speed	Quality	Max Quality
<b>Time Before Printing Commences</b>	13.66	13.69	14.38	13.08	11.24	10.53
<b>First Page Out</b>	94.81	130.69	242.20	103.84	134.81	267.89

First-page-out times are determined by sending an A1 retail poster JPEG file to print, timed from job release to page out with the Canon driver set to the matte coated paper setting and the Epson driver set to matte coated paper. Both devices were loaded with 24" rolls, with each job set to auto-rotate to save media.

## Colour Image Quality

### Colour Optical Density Evaluation

Canon imagePROGRAF iPF6400SE Matte coated paper						
	Highest Quality mode					
	1	2	3	4	Max.	Min.
<b>Cyan</b>	1.19	1.18	1.19	1.20	1.20	1.18
<b>Magenta</b>	0.96	0.96	0.96	0.96	0.96	0.96
<b>Yellow</b>	1.04	1.05	1.04	1.04	1.05	1.04
<b>Black</b>	1.51	1.50	1.50	1.50	1.51	1.50

Epson SureColor T3000 Matte coated paper						
	Quality (720 x 1440 dpi)					
	1	2	3	4	Max.	Min.
<b>Cyan</b>	1.14	1.15	1.14	1.13	1.15	1.13
<b>Magenta</b>	0.96	0.96	0.95	0.95	0.96	0.95
<b>Yellow</b>	1.14	1.14	1.14	1.14	1.14	1.14
<b>Black</b>	1.61	1.61	1.61	1.61	1.61	1.61

Note: Colour density readings were assessed by printing a BLI test file on matte coated paper in highest-quality colour settings and measuring the density of 100% dot fill using an Xrite 508 densitometer.

## Skin Tone and Neutral Grey Consistency

	Skin Tone 1 (C=6, M=15, Y=16, K=0)	
	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Colour block		
2	0.1	1.5
3	0.2	1.0
4	0.2	0.4
5	0.2	0.9
6	0.3	0.9
7	0.1	0.5
8	0.2	0.5
9	0.2	0.4
<b>Max. Delta E</b>	<b>0.3</b>	<b>1.5</b>

	Skin Tone 2 (C=30, M=63, Y=75, K=0)	
	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Colour block		
2	0.4	0.6
3	0.2	0.6
4	0.3	0.6
5	0.3	0.7
6	0.1	0.5
7	0.5	0.5
8	0.4	0.6
9	0.3	0.6
<b>Max. Delta E</b>	<b>0.5</b>	<b>0.7</b>

	Skin Tone 3 (C=19, M=33, Y=50, K=0)	
	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Colour block		
2	0.1	1.6
3	0.5	1.2
4	0.2	0.8
5	0.2	0.8
6	0.5	1.2
7	0.3	1.0
8	0.4	0.6
9	0.6	1.0
<b>Max. Delta E</b>	<b>0.6</b>	<b>1.6</b>

	Neutral Grey	
	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Colour block		
2	0.3	0.3
3	0.5	0.5
4	0.4	0.5
5	0.4	0.4
6	0.5	0.4
7	0.1	0.5
8	0.1	0.5
9	0.2	0.9
<b>Max. Delta E</b>	<b>0.5</b>	<b>0.9</b>

Note: Skin tone and neutral grey consistency measurements are based on nine readings taken from a BLI proprietary PDF test target file comprising four A1-sized solid coverage documents of three skin tones and a neutral grey, with the High/Quality print quality setting selected in the driver and the target printed on the manufacturer's own brand of matte coated media. Colour differences across the A1 image were measured comparing eight locations to that of the colour measured at the top left of the page, using an EFI ES1000 colour spectrophotometer and Gretag MacBeth EyeOne Share colour comparison software.

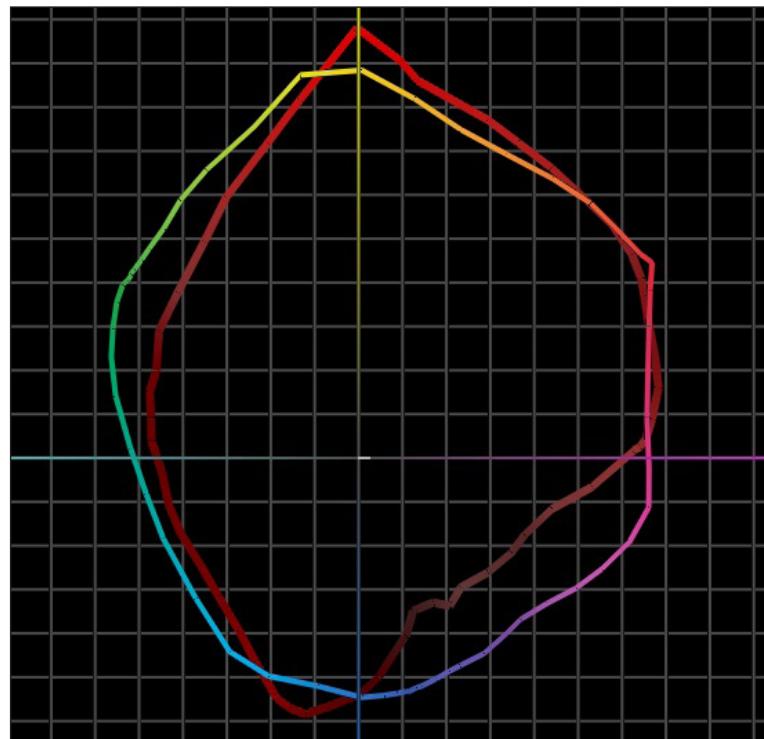
## FOGRA 39 DRIFT TEST: comparison of FOGRA39 colour patches before and after ink consumption test.

	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
<b>Delta E Drift</b>	1.3	0.8

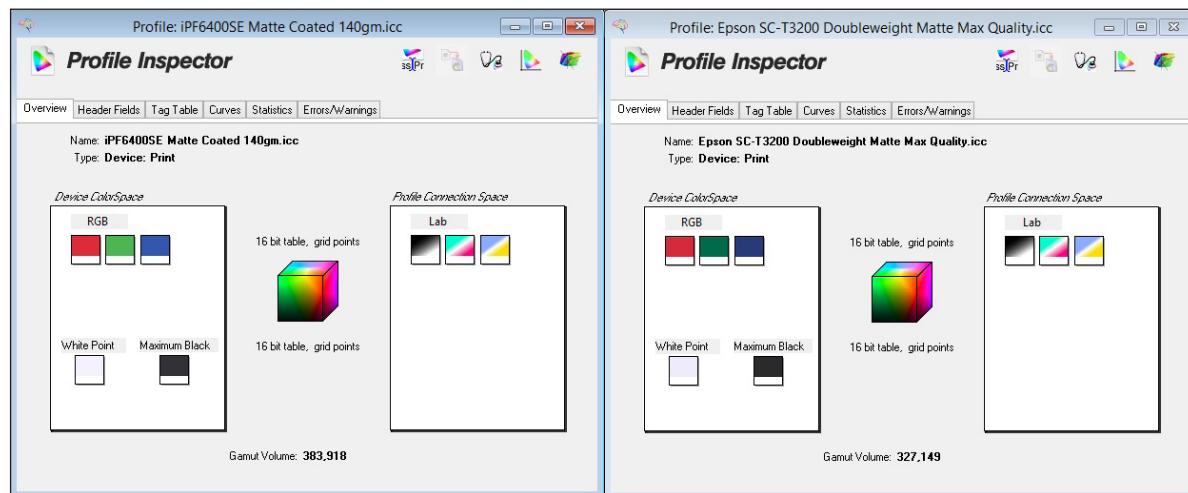
## Colour Gamut Comparison

Media Type/Settings	Canon imagePROGRAF iPF6400SE	Epson SureColor SC-T3200
Matte Coated High/Max Quality	383,918	327,149

## Colour Gamut Comparison



**Epson SureColor SC-T3200 colour gamut on matte coated paper in highest quality settings (red) versus Canon imagePROGRAF iPF6400SE colour gamut (shown chromatically) on matte coated paper in highest quality settings.**



**Colour gamut profiles for the Canon iPF6400SE (left) and Epson SureColor SC-T3200 (right) on matte coated paper in High/Max Quality modes.**

## Device Feature Set

	Canon imagePROGRAF iPF6400SE	Advantage	Epson SureColor SC-T3200
<b>Max. print quality</b>	2400 x 1200 dpi	✓	2880 x 1440 dpi
<b>Number of inks</b>	6	✓	5
<b>Ink tanks replaceable during operation</b>	Yes	✓	No
<b>Ink-drop size</b>	4 picoliter	✓	3.5 picoliter (variable)
<b>Ink cartridge capacity</b>	90 ml (Starter), 130 and 300 ml	✓	110 ml, 350 ml, 700 ml
<b>Number of nozzles</b>	2,560 nozzles each, 15,360 in total	✓	3,600 (720 per colour)
<b>Number of printheads</b>	1		1
<b>Line accuracy</b>	+/-0.1%		+/-0.1%
<b>Minimum line width</b>	0.02 mm		0.02 mm
<b>Minimum print margins</b>	3 mm		3 mm
<b>Maximum outside diameter of roll paper</b>	150 mm		149.86 mm
<b>Maximum cut-sheet media length</b>	1.6 m	✓	914 mm
<b>Maximum media thickness for roll paper</b>	0.8 mm		0.8 mm
<b>Maximum media width</b>	24 inches		24 inches
<b>Media loading</b>	Front		Front
<b>Optional media handling</b>	Roll holder set		Roll media adapter
<b>Standard RAM</b>	256 MB	✓	1 GB
<b>Maximum RAM</b>	256 MB	✓	1 GB
<b>Hard drive</b>	None	✓	Optional 320-GB
<b>Interface</b>	10/100Base-T Ethernet, USB 2.0	✓	10Base-T/100Base-TX/1000Base-T Ethernet, USB 2.0
<b>PDL</b>	GARO		HP-GL/2, HP RTL, Epson ESC/P-R
<b>Net weight (unpacked)</b>	54 kg		67 kg
<b>Power consumption when in standby</b>	5 W	✓	3 W
<b>Power consumption when active</b>	100 W	✓	52 W
<b>Acoustic pressure</b>	Operation: 49 dB (A) or less; Standby: 35 dB (A) or less	✓	Operation: 50 dB (A); Standby: INA
<b>Acoustic power</b>	Operation: 6.4 Bel's or less	✓	Operation: 6.8 Bel's

INA – Information not available

## Driver Feature Set

	Canon imagePROGRAF iPF6400SE	Advantage	Epson SureColor SC-T3200
<b>Speed settings</b>	5 (Draft 300, Standard 600, Draft 600, High 600 and 1200)	✓	3 (Speed, Quality, Max Quality), depending on paper chosen
<b>Economy mode</b>	Yes	✓	No
<b>Predefined profiles</b>	5	✓	8
<b>Overview of profile settings provided</b>	Yes		Yes
<b>Media profiles</b>	42	✓	20
<b>IQ optimized for print profiles</b>	Yes		Yes
<b>Watermark</b>	Yes	✓	No
<b>Sharpen text</b>	Yes		Yes
<b>Thicken fine lines</b>	Yes	✓	No
<b>Mirror image</b>	Yes		Yes
<b>Multi-up printing</b>	Yes, 2 to 16	✓	Yes, 2 and 4
<b>Poster print mode</b>	Yes (2 by 2)	✓	Yes (4 by 4)
<b>Page stamping</b>	Yes (Date, Time, Name, Page Number)	✓	Yes (Date, Time, Document/User/Printer Name, Media Type, Print Quality Level, Resolution, Print Mode, High Speed, Finest Detail, Edge Smoothing, Colour Adjustment and Value, Colour Density)
<b>Image rotation</b>	Yes, auto 180 degrees		Yes, auto 180 degrees
<b>Option to preview before print</b>	Yes		Yes
<b>CMYK balance adjustment</b>	Yes		Yes
<b>Brightness adjustment</b>	Yes		Yes
<b>Contrast adjustment</b>	Yes		Yes
<b>Saturation adjustment</b>	Yes		Yes
<b>Advanced colour management options</b>	Yes		Yes
<b>Enlarged Copy Mode</b>	Yes		Yes
<b>Free Layout Capability</b>	Yes		Yes
<b>MS Office Plug-in</b>	Yes		Yes
<b>Disable automatic cutter</b>	Yes		Yes
<b>Unidirectional printing</b>	Yes	✓	No

# Ink Consumption

**Table 1**

## Amount of Ink in Each Canon iPF6400SE Cartridge (grams)

**Table 2**

## Amount of Ink in Each Epson SureColor SC-T3200 Cartridge (grams)

	Cyan	Yellow	Magenta	Matte Black	Photo Black
<b>Weight of cartridge prior to installation</b>	512.5	511.4	510.9	517.7	512.1
<b>Weight of cartridge at end of life</b>	129.8	129.8	129.8	129.8	129.8
<b>Net weight of ink</b>	382.7	381.6	381.1	387.9	382.3
<b>Total ink weight across five cartridges</b>					1,915.6

**Table 3**

## Ink Used in Three 50-Page Runs of Retail Poster Test Document on the Canon iPF6400SE in Standard/Quality Mode (grams)

**Table 4**

**Ink Used in Three 50-Page Runs of Retail Poster Test Document on the Epson SureColor SC-T3200 in Standard/Quality Mode (grams)**

	Cyan	Yellow	Magenta	Matte Black	Photo Black
<b>Test Run 1 Net weight of ink used</b>	23.2	22.0	55.1	6.6	2.2
<b>Test Run 2 Net weight of ink used</b>	23.1	21.8	54.7	6.5	2.2
<b>Test Run 3 Net weight of ink used</b>	23.2	22.0	55.2	6.7	2.3
<b>Average amount of ink used across three runs</b>	23.2	21.9	55.0	6.6	2.2
<b>Total ink weight across five cartridges for 50-page run (based on averages)</b>					108.9

**Table 5**

**Ink Used in Three 50-Page Runs of Portrait Photo Test Document on the Canon iPF6400SE in Standard/Quality Mode (grams)**

	Black	Magenta	Red	Yellow	Cyan	Matte Black
<b>Test Run 1 Net weight of ink used</b>	22.7	26.9	5.1	21.2	24.1	2.6
<b>Test Run 2 Net weight of ink used</b>	22.8	27.0	4.0	20.8	26.4	1.5
<b>Test Run 3 Net weight of ink used</b>	23.9	27.3	5.6	21.1	26.2	2.4
<b>Average amount of ink used across three runs</b>	23.1	27.1	4.9	21.0	25.6	2.2
<b>Total ink weight across six cartridges for 50-page run (based on averages)</b>						103.9

**Table 6**

**Ink Used in Three 50-Page Runs of Portrait Photo Test Document on the Epson SureColor SC-T3200 in Standard/Quality Mode (grams)**

	Cyan	Yellow	Magenta	Photo Black	Matte Black
<b>Test Run 1 Net weight of ink used</b>	34.8	30.2	38.4	9.8	16.7
<b>Test Run 2 Net weight of ink used</b>	35.1	30.2	38.3	9.8	16.7
<b>Test Run 3 Net weight of ink used</b>	34.6	30.0	37.7	9.2	16.1
<b>Average amount of ink used across three runs</b>	34.8	30.1	38.1	9.6	16.5
<b>Total Ink Weight across five cartridges for 50-page run (based on averages)</b>					129.1

## Ink Consumption Test Methodology Overview:

Buyers Lab's ink consumption analysis was conducted using two document types (retail poster and portrait photo). The retail poster was formatted as a JPEG file and the portrait photo was formatted as a TIFF file and both were sized at ISO A1.

The Canon imagePROGRAF iPF6400SE was installed in BLI's lab with the latest "01-22" level of firmware (as of September 2014) and connected to a Windows 7 workstation using a 1000Baset TCP/IP connection. The device was left in default configuration throughout testing. The Canon GARO driver was used for all testing and was left in default colour setting configuration. The retail sale poster was printed on matte coated media in standard mode, and the studio portrait photo was printed on 170 gsm glossy photo media in standard mode.

The Epson SureColor SC-T3200 was installed in BLI's lab with the latest "MW028E7,F7,10,5000" level of firmware (as of September 2014) and connected to a Windows 7 workstation using a 100BaseT TCP/IP connection. The device was left in default configuration throughout testing. The Epson ESC/P 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. The retail sale poster was printed on Epson Double Weight matte coated media in Quality mode, and the studio portrait photo was printed on 170 gsm glossy photo media in Quality mode.

Before installing the ink cartridges, BLI 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. Then, for each model, one cartridge was run to exhaustion and the weight of the empty cartridge was recorded.

## 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

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 a BLI 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 a profile software tool from Colour Confidence and 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.

## About Buyers Laboratory Inc.

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Buyers Laboratory LLC (BLI) is the world's leading independent provider of analytical information and services to the document imaging and document management industry. For more than 50 years, buyers have relied on BLI to help them differentiate products' strengths and weaknesses and make the best purchasing decisions, while industry sales, marketing and product professionals have turned to BLI for insightful competitive intelligence and valued guidance on product development, competitive positioning and sales channel and marketing support. Using BLI's web-based bliQ and Solutions Center services, 40,000 professionals worldwide create extensive side-by-side comparisons of hardware and software solutions for more than 15,000 products globally, including comprehensive specifications and the performance results and ratings from BLI's unparalleled Lab, Solutions and Environmental Test Reports, the result of months of hands-on evaluation in its US and UK labs. The services, also available via mobile devices, include a comprehensive library of BLI's test reports, an image gallery, hard to find manufacturers' literature and valuable tools for configuring products, calculating total cost of ownership (TCO) and annual power usage. BLI also offers consulting and private, for-hire testing services that help manufacturers develop and market better products and consumables.

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