

Comparative Performance Testing

DECEMBER 2019

Canon PIXMA G4511 versus Device A and Device B

Test Objective

Keypoint Intelligence - Buyers Lab was commissioned by Canon Europe Ltd. to conduct a comparative image quality evaluation of the Canon PIXMA G4511 inkjet printer, Device A and Device B. Testing was based on printing a mix of proprietary and Buyers Lab image quality test targets on budget office paper, premium paper, and glossy photo paper. Buyers Lab technicians compared the results of the Canon inkjet model with that of Device A and Device B. The three test devices were operated in default (Standard) mode and draft (Eco) mode on budget and premium media, and the best quality mode available when printing on photo paper. Buyers Lab technicians also tested the optical density of output from each device as well as the colour gamut. Testing was conducted at Buyers Lab's European test facility in Wokingham, UK. The Canon PIXMA G4511 is also sold as the Canon PIXMA G4411 and Canon PIXMA G4410, so this report is also applicable to those devices.

Executive Summary

Users expect great image quality from even low-end colour printers. In Buyers Lab's test, all three devices provided good image quality when run in Standard mode to varying degrees, but when printing in Eco mode the Canon PIXMA G4511 was the clear leader.

In Eco mode, Device A's photographic image quality was washed out and grainy, with poor detail. The Canon PIXMA G4511's and device B's were superior, but the latter's text reproduction was poor compared to that of the other two devices. Plus, the Canon PIXMA G4511 had the highest CIE colour gamut in both modes and the second highest in its best quality mode on glossy photo paper.

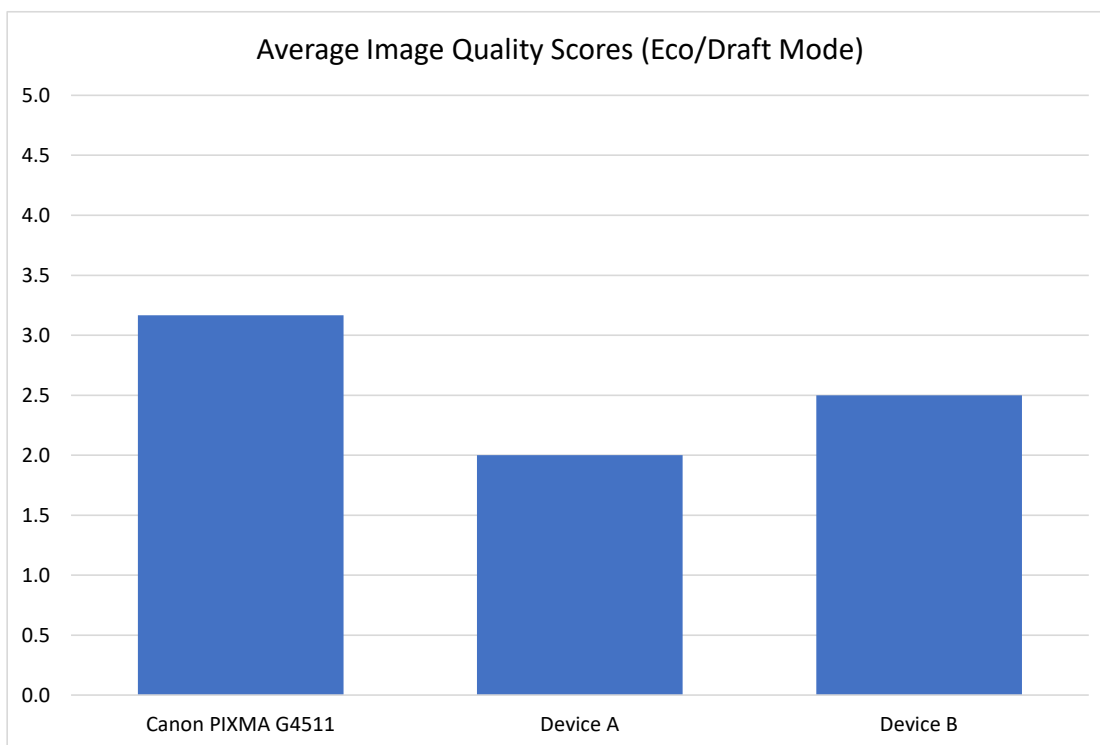
Overall, the Canon PIXMA G4511 provides the best image quality in both Eco and Standard modes. If great image quality is of paramount concern in all situations, then of the three devices tested the Canon PIXMA G4511 is the device to choose.

Image Quality

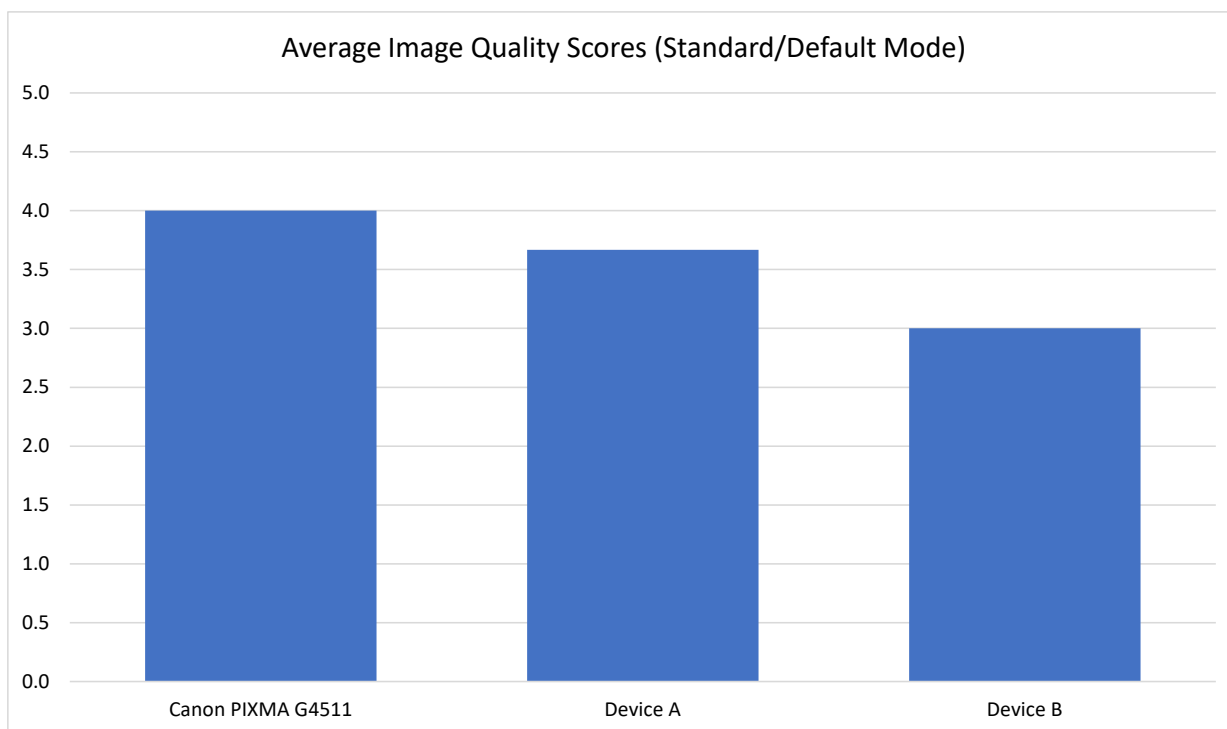
Using a range of proprietary test targets, Buyers Lab assessed the devices' image quality from a variety of perspectives, including optical density, text, fine lines, photographic image reproduction, and colour gamut volume. All tests were conducted in draft and default modes on all devices. Two types of media were used when testing in draft mode: 80 gsm budget office paper and 80 gsm premium paper. Two types of paper were used when testing in default mode: 80 gsm budget office paper and 80gsm premium paper. One paper type was used when testing the best available quality: 180 gsm glossy photo paper. Each device's results for text and fine lines, halftone range and pattern, photographic images, and business graphics was graded on a five-point scale where 5 is excellent, 4 is very good, 3 is good, 2 is poor, and 1 is very poor.

- The Canon PIXMA G4511 had the advantage for both draft and default mode image quality. In draft mode, the Canon's average score was 50% higher than Device A's and 13% higher than Device B's.
- In default mode, the Canon's average image quality score was 9% and 33% higher than Device A and Device B's, respectively.

Overall Image Quality Scores (Draft/Fastest Mode)



Average image quality scores are based on assigned grades of 1 through 5, where 5 is best.



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Detailed Image Quality Scores

	Canon PIXMA G4511	Device A	Device B
Draft Mode Budget	18	12	16
Draft Mode Premium	18	12	16
Standard Mode Budget	24	22	18
Standard Mode Premium	24	22	18

Each device's results for text and fine lines, halftone range and pattern, photographic images, and business graphics were graded on a five-point scale where 5 is excellent, 4 is very good, 3 is good, 2 is poor, and 1 is very poor. See Supporting Test Data section for more information on how each area was scored.

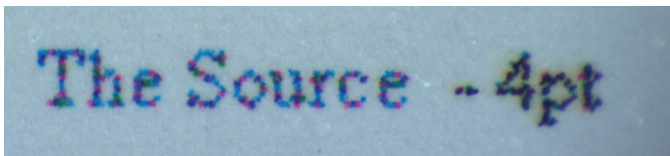
Text and Fine Line Reproduction

- In Eco/draft mode, the Canon PIXMA G4511 produced the best Arial and Times New Roman text quality. The text was better defined and more legible than that of device A or Device B. However, the text was deemed to be good rather than very good, as text was only legible to 5-pt. size.
- In Eco/draft mode, Device A's Arial text was legible but not as well formed as the Canon PIXMA G4511's, although much better than Device B's. Even so, text was legible to 6-pt.
- In Eco/draft mode, Device B's text was poorly formed, and this had a big impact on legibility, with 6-pt. text being the smallest font size at which text is properly legible. Text was heavily broken, especially Times New Roman text.

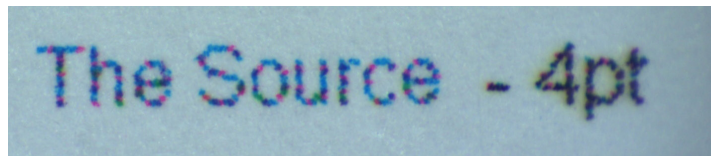
- In Standard/default mode, the Canon G4511 also had the most clearly formed text of the three devices' output. There were some breaks in the Times New Roman at 4-pt. size, but the text was still more legible than either Device A or Device B's. The Canon G4511's Arial text was even crisper and better formed.
- In both modes, Device A's Times New Roman text was less well-defined but darker than the Canon G4511's. At the same time, breaks in Device A's text further reduced legibility. Device A's Arial text was more defined, but it wasn't as crisp as the Canon's.
- In Standard/default mode, Device B showed few breaks at 4-pt. size, but that was mostly because the letters in Times New Roman and Arial text were reproduced messily, which made the letters indistinct. Text looked better at higher font sizes, but this is to be expected. Device B's Arial text was better defined than its Times New Roman text.
- In its best available print mode, the Canon PIXMA G4511 had the best Times New Roman text reproduction, although Device A was not far behind. Device A's Times New Roman text was a little more broken than the Canon device's, but still decently formed. Device B's text in its best quality mode was not quite as well formed as that of the Canon G4511 and Device A. Arial text was better produced than Times New Roman text for all devices.
- In Eco/Draft mode, all three of the devices scored Poor for dots, as some of the dots were completely missing or were indistinct.
- In Standard/Default mode, Device A's dots were still deemed to be poor due to missing dots, while Device B and Canon G4511 were rated Good.

Text Quality Examples – Eco/Draft Mode

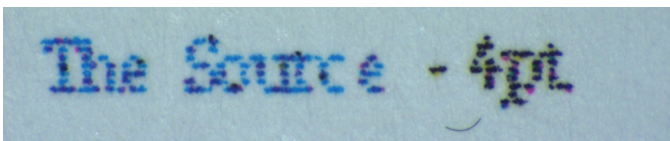
The magnified samples below show output at 4-pt. size when printed on 80 gsm premium paper.



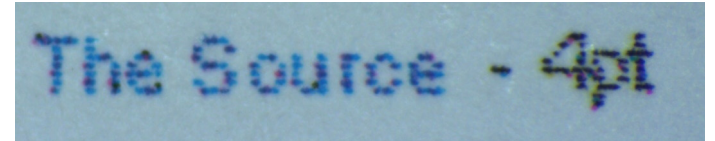
Canon PIXMA G4511 Times New Roman



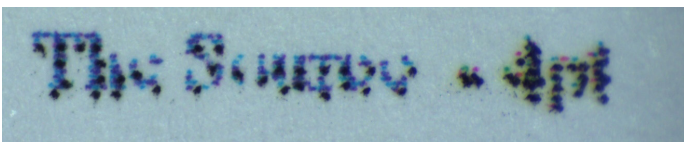
Canon PIXMA G4511 Arial



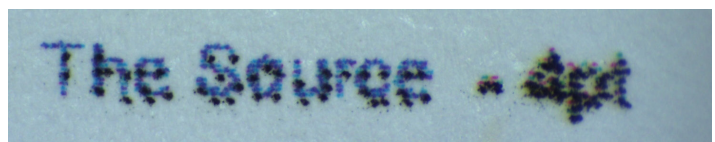
Device A Times New Roman



Device A Arial



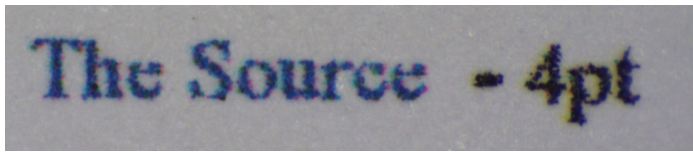
Device B Times New Roman



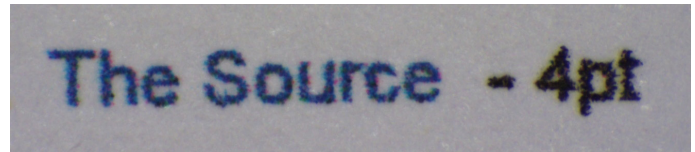
Device B Arial

Text Quality Examples – Standard/Default Mode

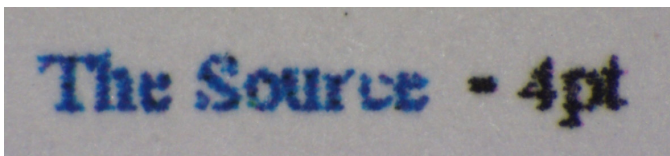
The magnified samples below show output at 4-pt. size when printed on 80 gsm premium paper



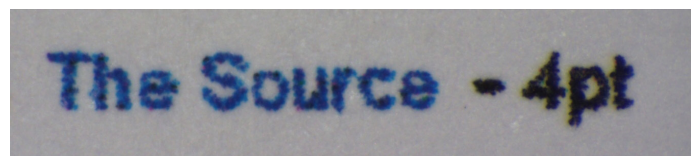
Canon PIXMA G4511 Times New Roman



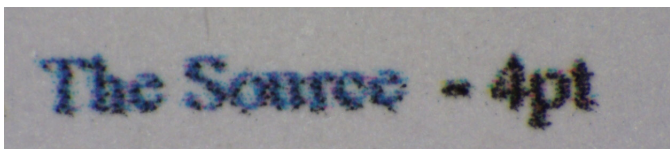
Canon PIXMA G4511 Arial



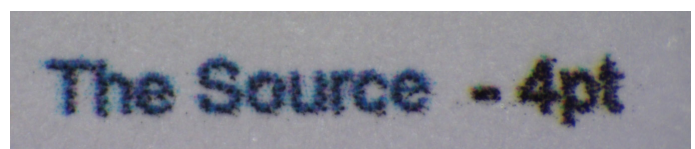
Device A Times New Roman



Device A Arial



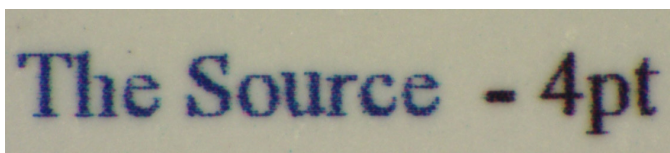
Device B Times New Roman



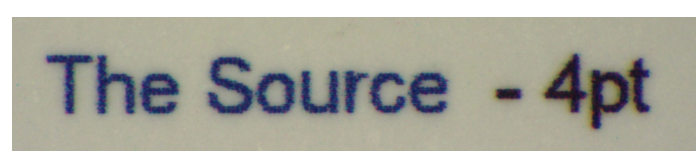
Device B Arial

Text Quality Examples – Standard/Default Mode

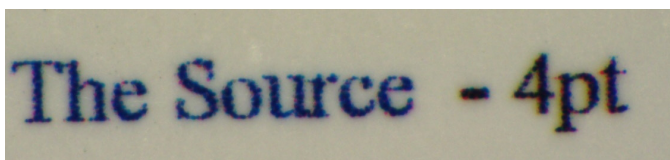
The magnified samples below show output at 4-pt. size when printed on 180 gsm photo paper.



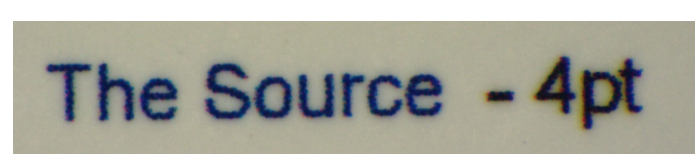
Canon PIXMA G4511 Times New Roman



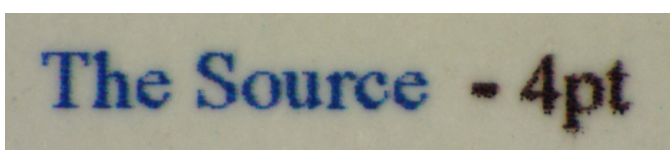
Canon PIXMA G4511 Arial



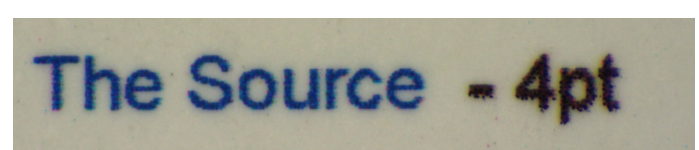
Device A Times New Roman



Device A Arial



Device B Times New Roman


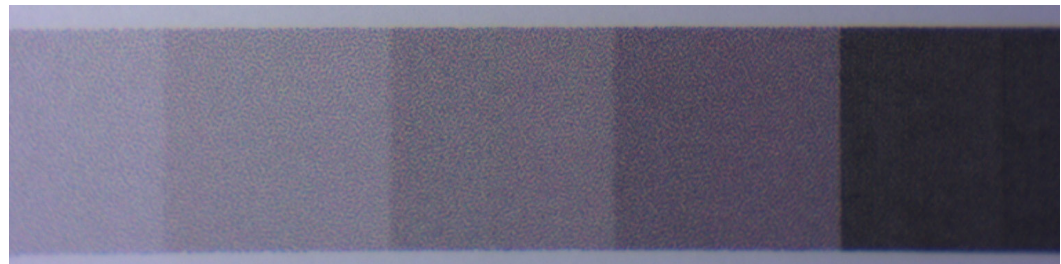
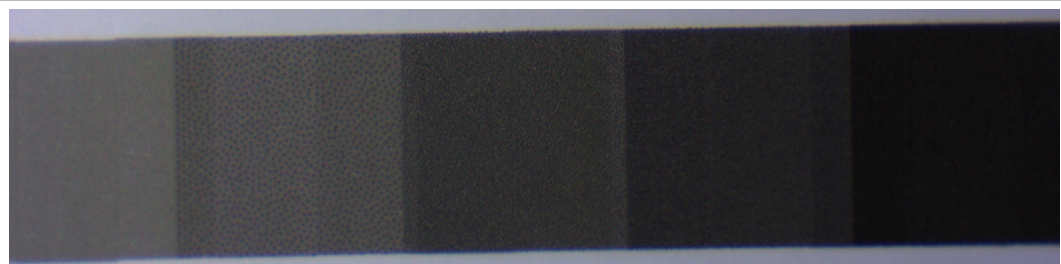


Device B Arial

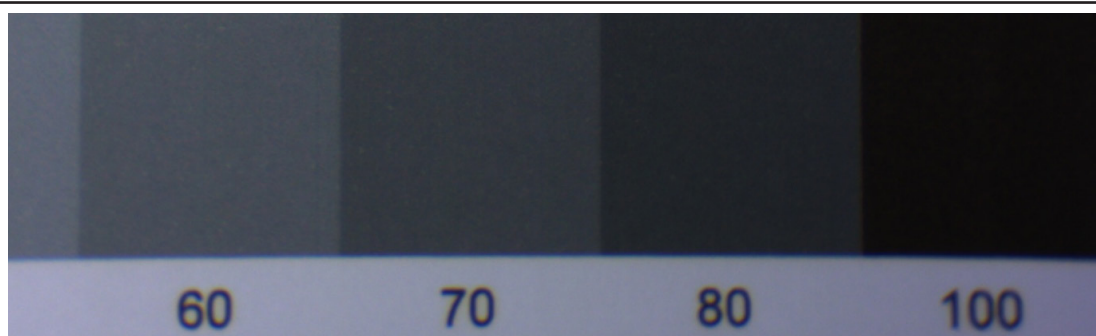
Halftone Fill Coverage

- In both modes all three devices exhibited clear distinction between every level of the 10% to 100% dot-fill range, but halftone fill for each wasn't perfect, though it was marginally better in Standard/default mode.
- The Canon G4511's fills were considered good in Eco/Draft mode because they had a red tinge and no gradation from one tone of grey to another, to give two examples. The colour halftones were better, but not as good as we'd like.
- Device B's Eco/Draft mode halftones fills were very inconsistent, with different shades within the blocks, such as lighter colours where there should be darker colours. Coloured and grey halftones suffered from a mottled appearance.
- Device A's Eco/Draft halftone fills were overly light and washed out, with a coloured, mottled fill in the grey fills that gave them an even more red appearance than the Canon PIXMA G4511.
- In Standard/Draft mode, the Canon G4511's and Device A's halftones were judged to be very good due to very good solid colour and grey fills. Device B's halftone fills were deemed to be good due to their overly dark appearance and inconsistently coloured and mottled grey fills.

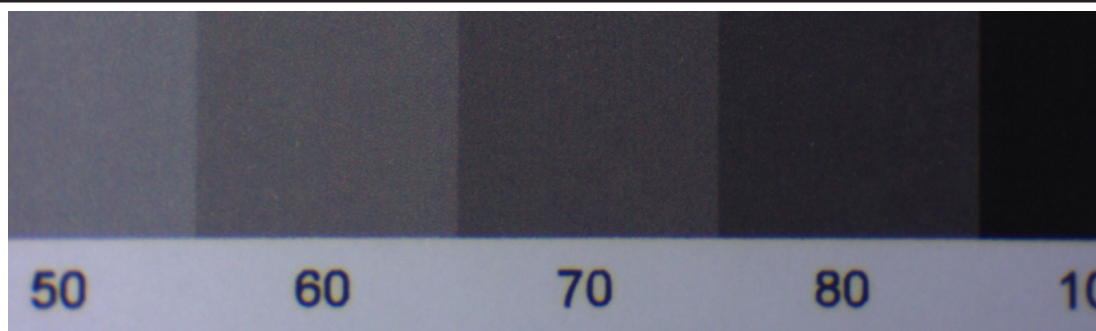
Halftone Fills (Eco/Draft Mode, 80 gsm Premium Paper)

 <p>50 60 70 80 100</p>	<p>Canon PIXMA G4511</p>
 <p>50 60 70 80 100</p>	<p>Device A</p>
 <p>50 60 70 80 100</p>	<p>Device B</p>

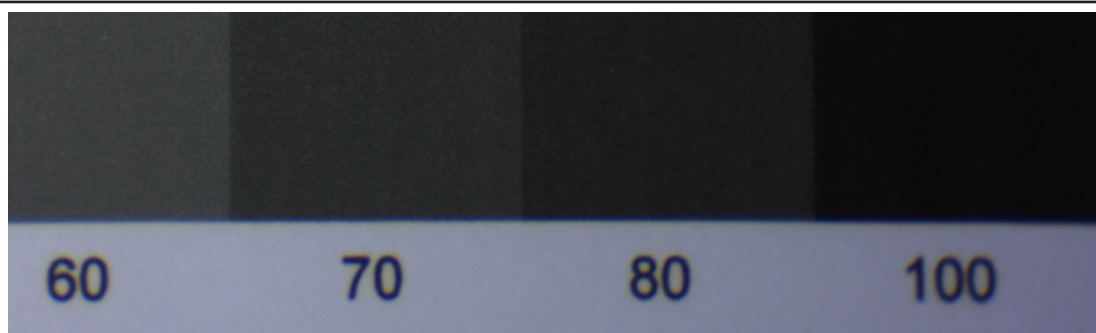
Halftone Fills (Standard/Default Mode, 80 gsm Premium Paper)



Canon
PIXMA G4511



Device A



Device B

Subjective Photographic Image Quality

Standard/Default Mode

- Photographic image quality of each device was judged to be at least Good, regardless of media. Device A and the Canon G4511 were both rated Very Good. Regardless of media, photographic image quality for the Canon and Device A was judged to be Very Good, while that for the Device B was Good.
- Device B was awarded a Good grade for photographic image quality because it was acceptable but output was grainier than that of Device and the Canon G4511, with pronounced banding in some areas and elements such as clouds that were not as well rendered as those of the Canon G4511.
- Device A's output was on par with the Canon G4511's output, although there were some areas where it was slightly deficient. One such area was a patch of cloudy sky, which had shape and form in the Canon output but less so in Device A's output. Such things affect the smoothness of an image and the level of detail therein. Again, this was a minor deficiency and one that didn't negate the awarding of the same grade to Device A's output, but it still existed.

Eco/Draft Mode

- It was when judging the Eco/Draft mode output of the three devices that differences in quality became more pronounced. The Canon G4511's output suffered a slight decrease in quality to Good compared to its Standard/Default mode's Very Good, but the Canon G4511 still produced the best photographic image quality. There was a slight graininess compared to its Standard/Default mode output, but there was still a very high level of detail, good colour reproduction and skin tones.
- Device A produced the worst output of the three devices. Its output is overly light, very washed out and grainy, with unrealistic skin tones. All this reduces detail.
- Device B's photographic image quality was a good match for that of the Canon G4511, with both devices being given the same grade. Whereas the Canon's output was just a little too light in places, Device B's was a little too dark. Not so much that either device's output was ruined but enough to create a difference between the two.

Examples from the Original Photographic Image and Skin Tones Test Targets



Photographic Image Quality (Eco/Draft Mode, 80 gsm Premium Paper)



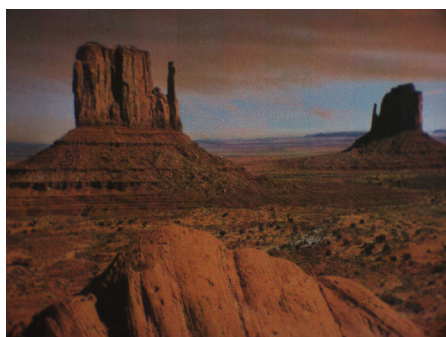
Canon PIXMA G4511



Device A



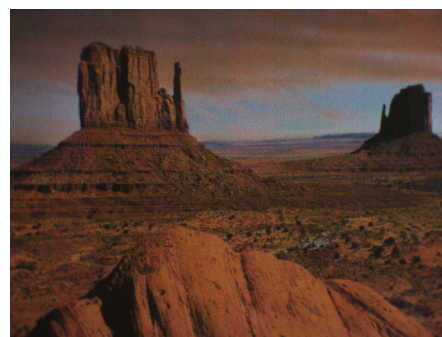
Device B



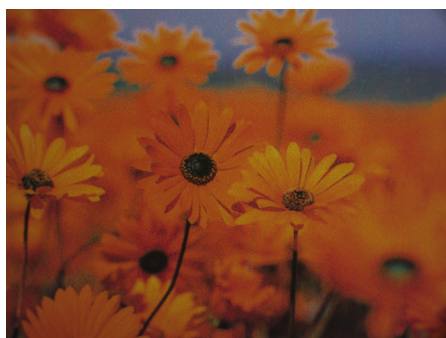
Canon PIXMA G4511



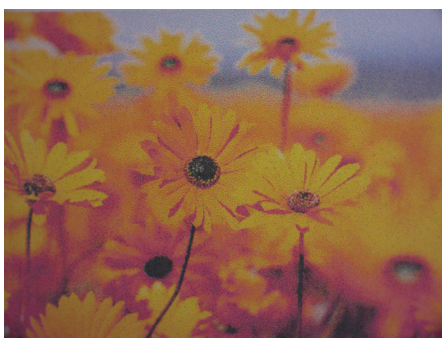
Device A



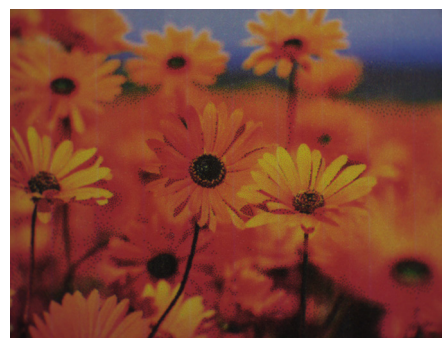
Device B



Canon PIXMA G4511



Device A



Device B

Photographic Image Quality (Standard/Default Mode, 80 gsm Premium Paper)



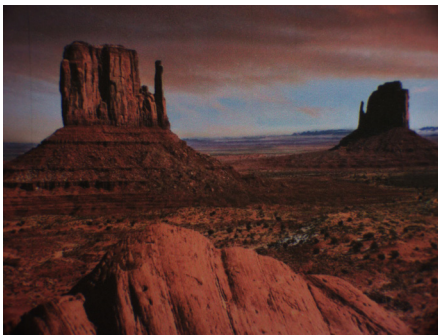
Canon PIXMA G4511



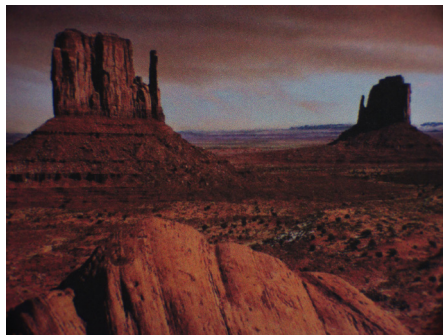
Device A



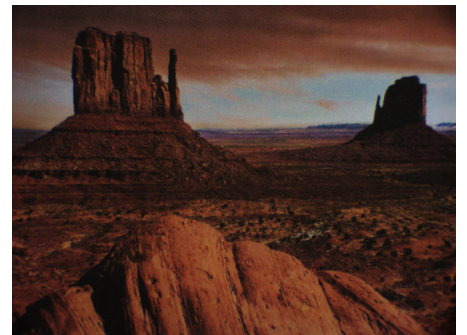
Device B



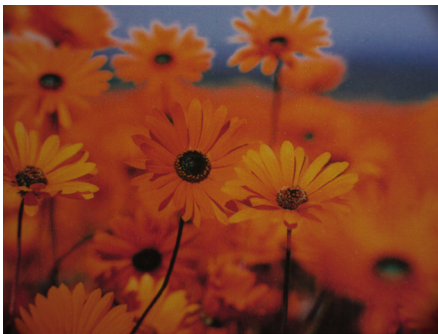
Canon PIXMA G4511



Device A



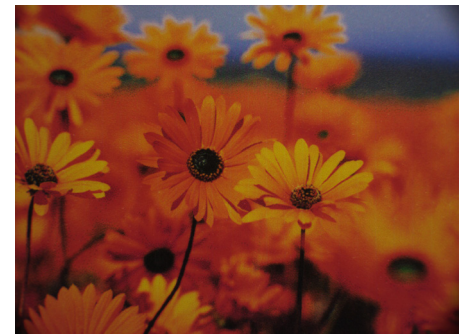
Device B



Canon PIXMA G4511



Device A



Device B

Photographic Image Quality (Best mode, 180 gsm Glossy Paper)



Canon PIXMA G4511



Device A



Device B



Canon PIXMA G4511



Device A



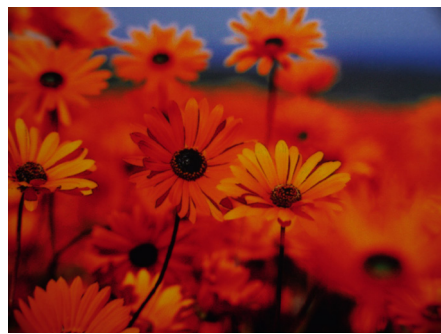
Device B



Canon PIXMA G4511



Device A



Device B

Skin Tone Quality (Eco/Draft Mode, Premium Paper)



Canon PIXMA G4511



Device A



Device B

Skin Tone Quality (Standard/Default Mode, Premium Paper)



Canon PIXMA G4511



Device A



Device B

Skin Tone Quality (Best Quality Mode, Glossy Paper)



Canon PIXMA G4511



Device A

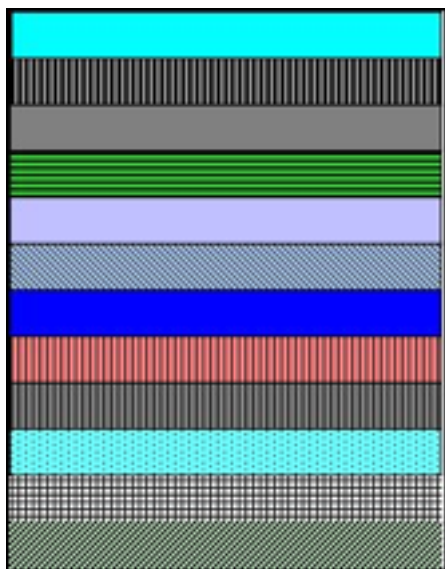


Device B

Colour Business Graphics Reproduction

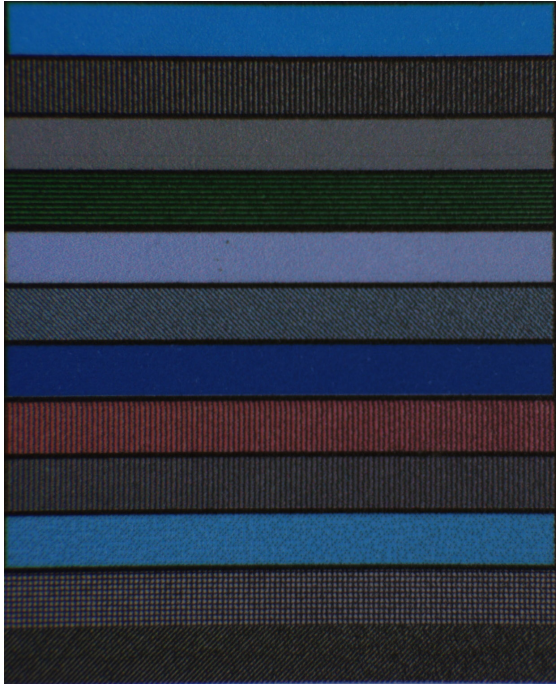
Using an industry-standard KATUN test document and proprietary test targets, Buyers Lab assessed the business graphics output produced by each device when using budget and premium paper in draft and default modes, and when using glossy paper in the best quality mode available.

The test target is an Excel spreadsheet test target that contains many textual, graphical, and functional elements. Devices typically reproduce some elements correctly, but not others. The test target can be seen in the Supporting Test Data section, but a portion of it is displayed below.

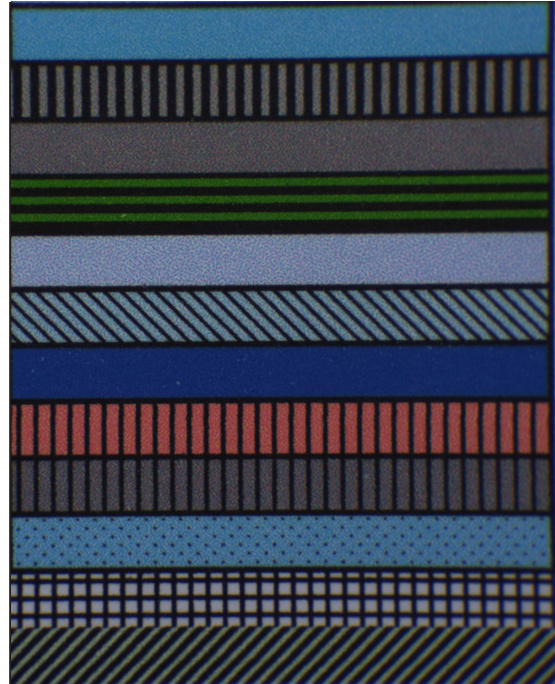


Sample from the Business Colour Graphic Excel Test File

Business Colour Graphics (Standard/Default Mode, Premium paper)



The Canon PIXMA G4511 did a decent job of reproducing the colours and the fill patterns, but the patterns are too thin or too small. They're visible under magnification, but not so easily visible with the naked eye.



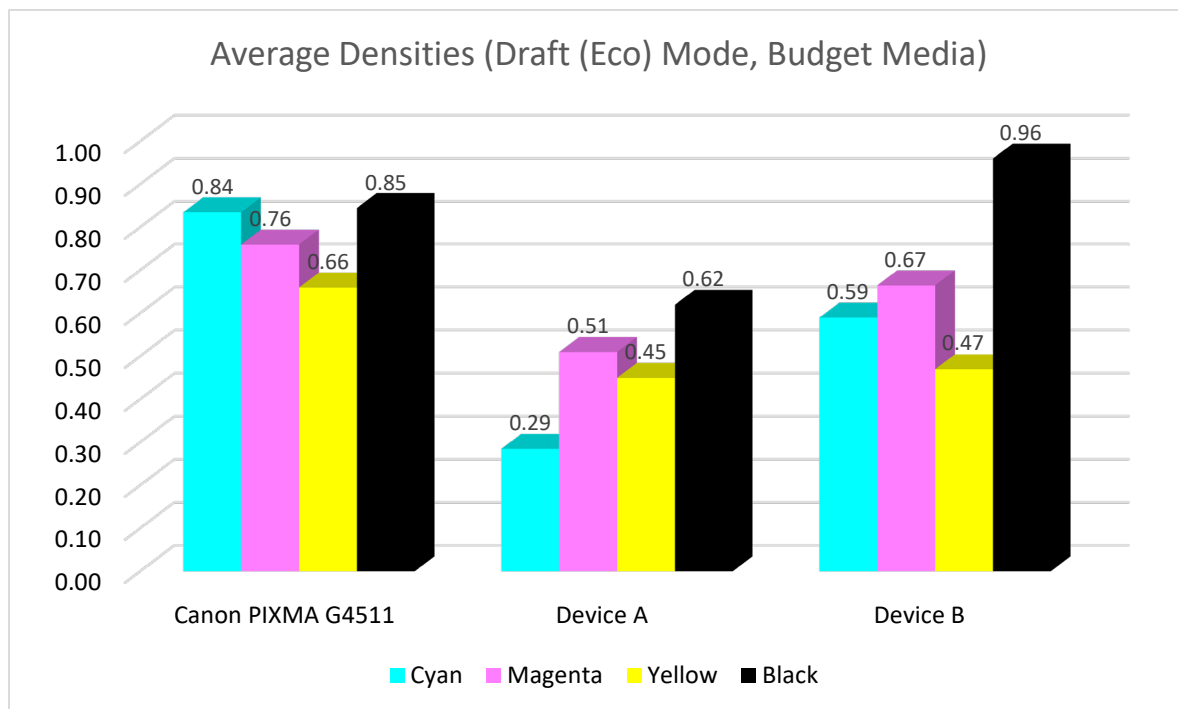
Device A did the best job of reproducing the colours and fill patterns, but they're still not perfect as the bars in the fill patterns are too thick.



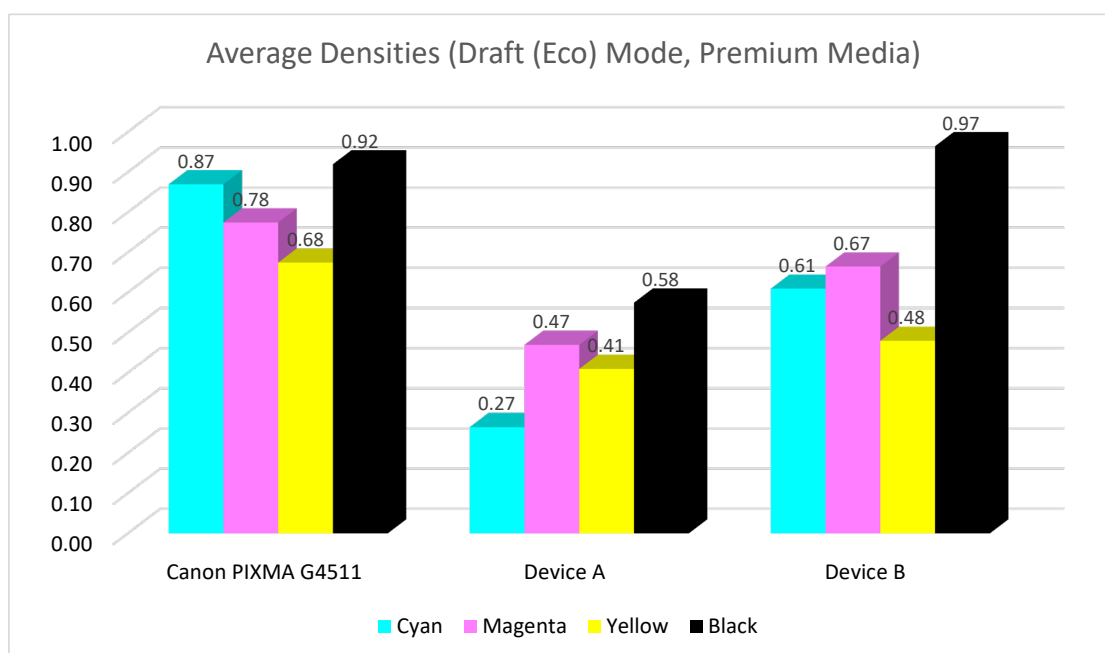
Device B did a poor job of reproducing the colours (overly dark) and fills (missing or incorrect).

Optical Density

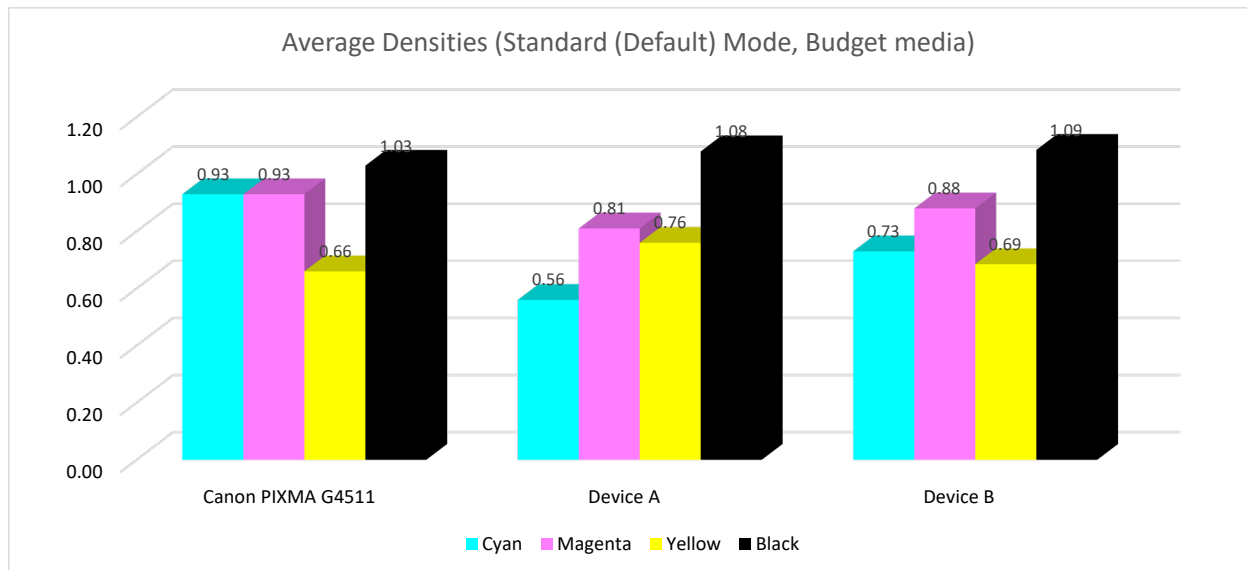
A higher print density reading for black means that output will be darker and/or richer. However, a higher density isn't always better for cyan, magenta, and yellow, as the most desirable density depends on context and both the clarity and accuracy of colour production.



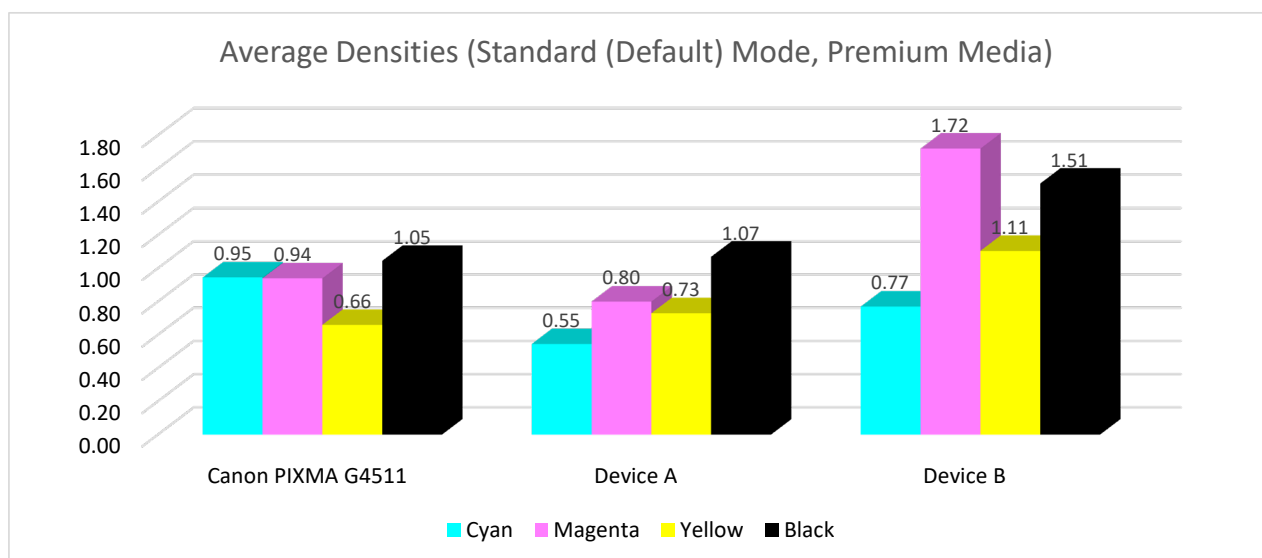
Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on budget paper in Eco/draft mode.



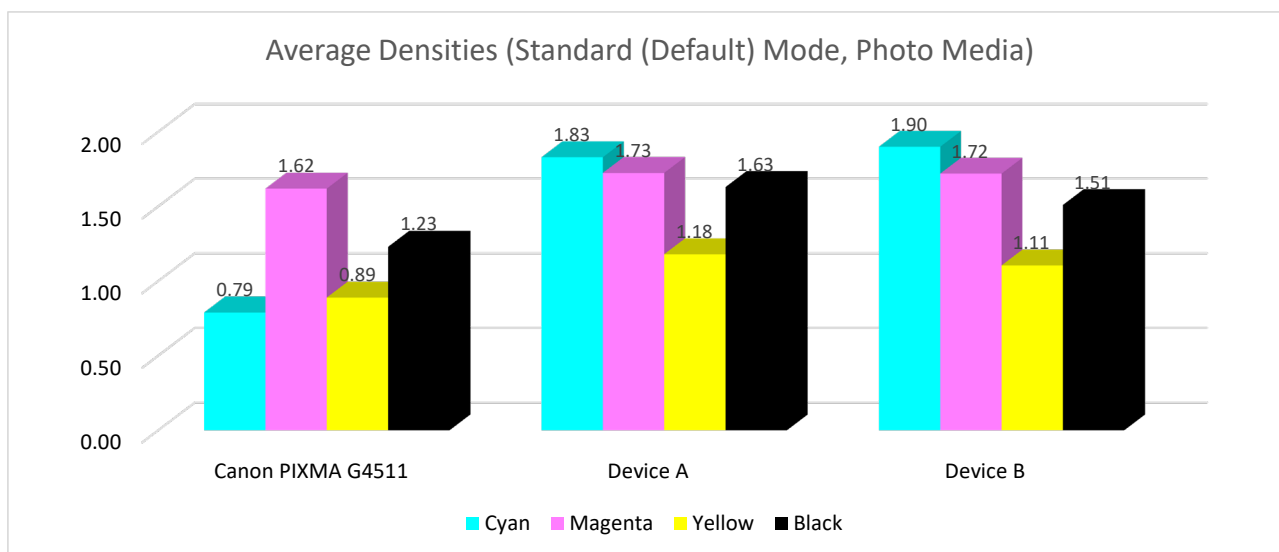
Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on premium paper in Eco/draft mode.



Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on gloss photo paper in Standard/default mode.



Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on gloss photo paper in Standard/default mode.



Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on gloss photo paper in each printer's best quality mode.

Average Density (Draft Mode)

	Budget				Premium			
	C	M	Y	K	C	M	Y	K
Canon PIXMA G4511	0.84	0.76	0.66	0.85	0.87	0.78	0.68	0.92
Device A	0.29	0.51	0.45	0.62	0.27	0.47	0.41	0.58
Device B	0.59	0.67	0.47	0.96	0.61	0.67	0.48	0.97

This table shows the average CMYK densities of each device tested in its fastest mode using budget and premium paper. A higher number indicates darker output.

Average Density (Standard Mode)

	Budget				Premium				Photo			
	C	M	Y	K	C	M	Y	K	C	M	Y	K
Canon PIXMA G4511	0.93	0.93	0.66	1.03	0.95	0.94	0.66	1.05	0.79	1.62	0.89	1.23
Device A	0.56	0.81	0.76	1.08	0.55	0.80	0.73	1.07	1.83	1.73	1.18	1.63
Device B	0.73	0.88	0.69	1.09	0.77	1.72	1.11	1.51	1.90	1.72	1.11	1.51

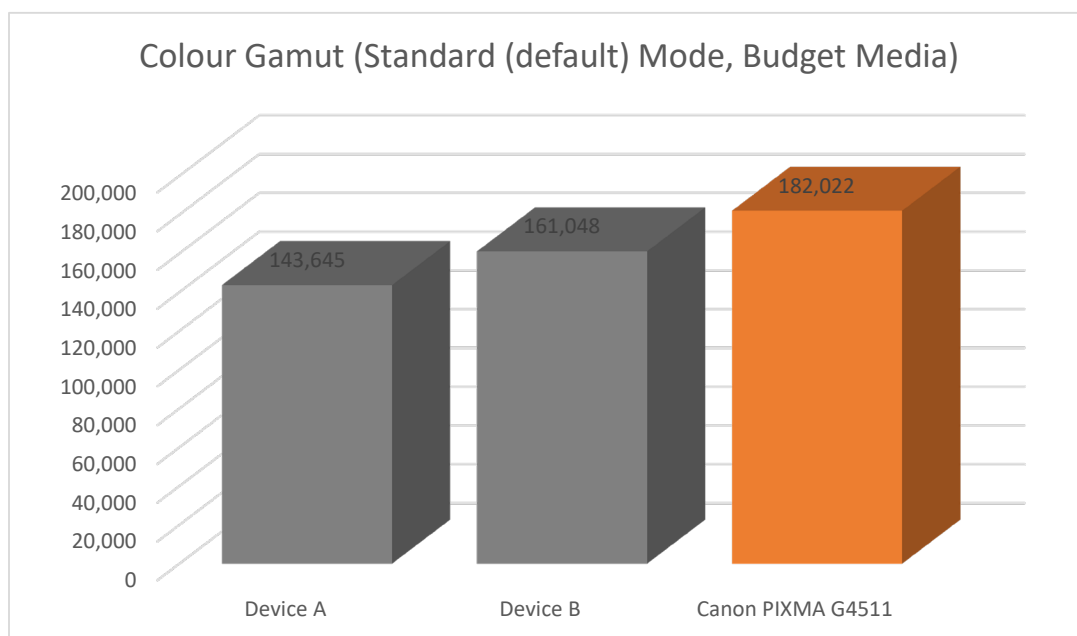
Average CMYK densities of each device tested in default mode are calculated based on two readings for black and two readings for each colour, using output on budget, premium, and photo paper. A higher number indicates darker output.

Colour Gamut

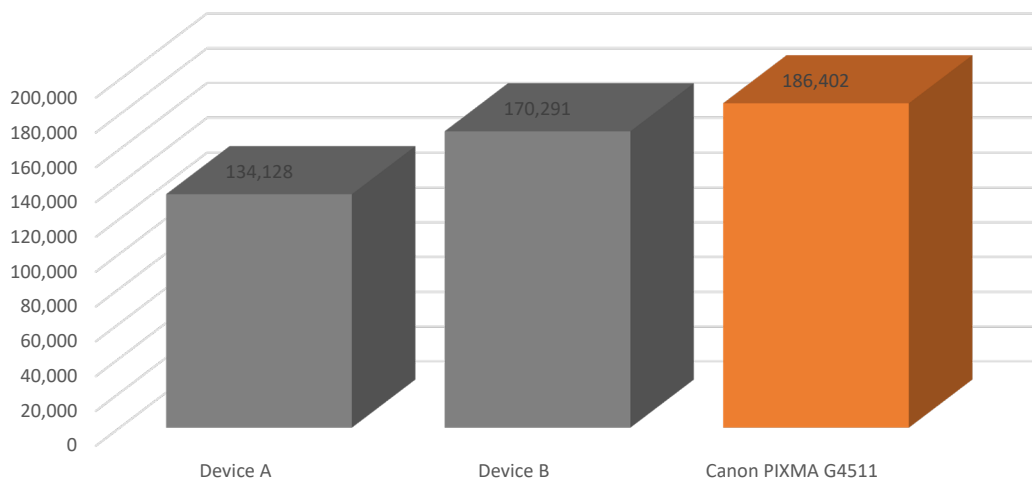
Setting	Media	Canon PIXMA G4511	Device A	Device B
Standard	Budget	182,022	143,645	161,048
	Premium	186,402	134,128	170,291
Best	Photo	508,412	494,423	581,312

Colour gamut was only tested in Standard mode.

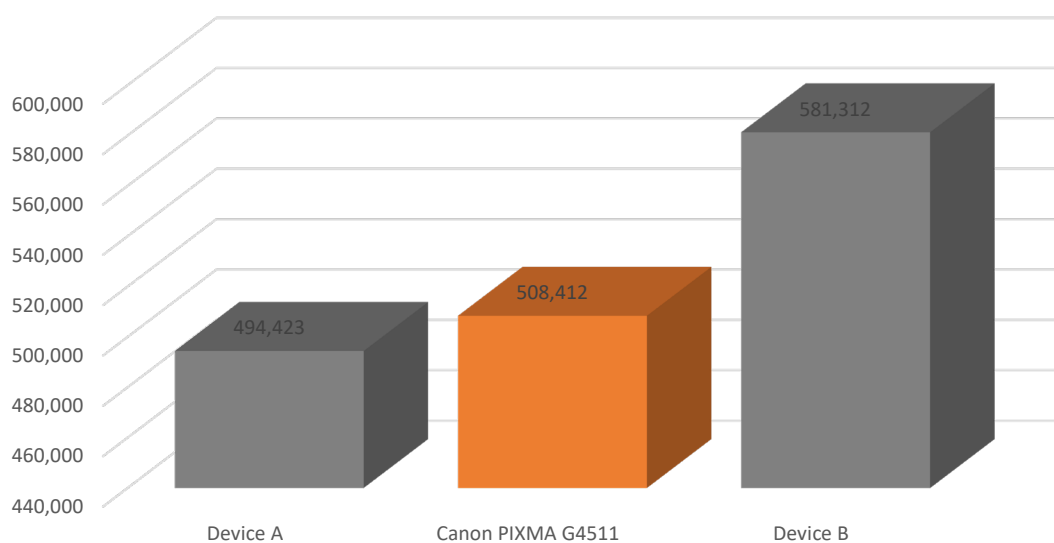
- The Canon PIXMA G4511's output had the highest CIE reading when printed on budget and premium media. However, its colour gamut reading on photo paper was only slightly higher than that of Device A, and 12.5% lower than that of Device B.
- When printed on budget media, the Canon PIXMA G4511's output had a reading that was 26.7% and 13.0% higher than that of Device A and Device B, respectively.
- When printed on premium media, the Canon PIXMA G4511's output had a reading that was 39.0% and 9.5% higher than that of Device A and Device B, respectively.



Colour Gamut (Standard (default) Mode, Premium Media)

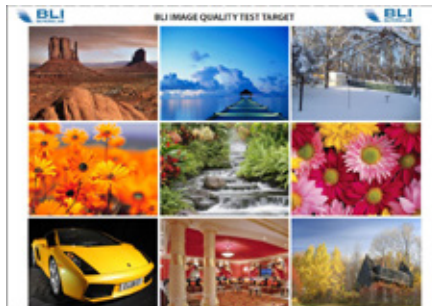
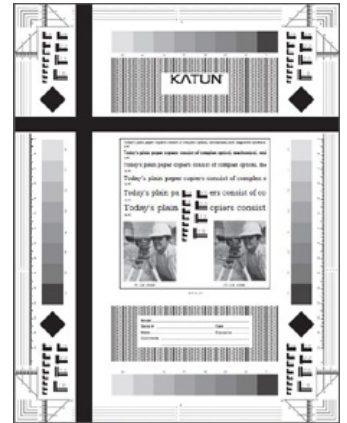
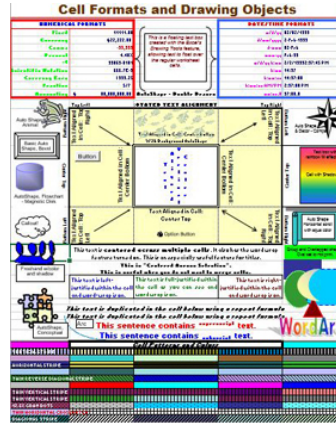
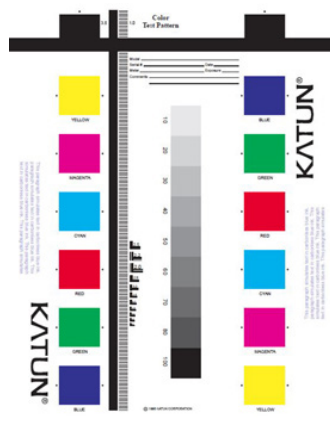
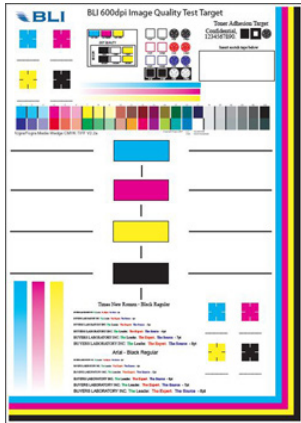


Colour Gamut (Standard (default) Mode, Photo Media)



Supporting Test Data

Buyers Lab used a variety of proprietary image quality test files to test the three devices. The documents used are displayed below.



For the total image quality scores, each criterion is rated individually. The bottom row labelled "TOTAL" is the total across all criteria. A maximum of 30 points is available.

Speed	Media		Canon PIXMA G4511	Device A	Device B
Eco / Draft	Budget	Text	3	2	2
		Line Art	3	2	2
		Halftone Range	3	2	3
		Halftone Pattern	2	2	3
		Photographic Images	3	2	3
		Business Graphics	4	2	3
		TOTAL	18	12	16
Eco / Draft	Premium	Text	3	2	2
		Line Art	3	2	2
		Halftone Range	3	2	3
		Halftone Pattern	2	2	3
		Photographic Images	3	2	3
		Business Graphics	4	2	3
		TOTAL	18	12	16
Standard	Budget	Text	4	3	3
		Line Art	4	3	3
		Halftone Range	4	4	3
		Halftone Pattern	4	4	3
		Photographic Images	4	4	3
		Business Graphics	4	4	3
		TOTAL	24	22	18
Standard	Premium	Text	4	3	3
		Line Art	4	3	3
		Halftone Range	4	4	3
		Halftone Pattern	4	4	3
		Photographic Images	4	4	3
		Business Graphics	4	4	3
		TOTAL	24	22	18
Best	Gloss Photo	Text	4	4	3
		Line Art	5	4	4
		Halftone Range	4	4	3
		Halftone Pattern	4	4	3
		Photographic Images	4	4	3
		Business Graphics	4	3	3
		TOTAL	25	23	19

Based on a five-point scale where 5 is excellent, 4 is very good, 3 is good, 2 is poor and 1 is very poor.

Test Methodology

Buyers Lab used three test devices and printed a series of image quality test targets on each device. All three devices were operated in Eco/Draft (fastest) and Standard/Default modes. Tests were conducted using different media types as follows:

Device	Media Type		
	Budget	Premium	Photo
Canon PIXMA G4511	Pukka Paper Everyday A4 80 gsm	Canon Red Label Presentation A4, 80 gsm	Staples Everyday Photo Quality Paper (Glossy), 180 gsm
Device A	Pukka Paper Everyday A4 80 gsm	Canon Red Label Presentation A4, 80 gsm	Staples Everyday Photo Quality Paper (Glossy), 180 gsm
Device B	Pukka Paper Everyday A4 80 gsm	Canon Red Label Presentation A4, 80 gsm	Staples Everyday Photo Quality Paper (Glossy), 180 gsm

In addition to a visual observation, colour print quality and gamut size are evaluated using XRite i1 profile software and an i1 Pro colour spectrophotometer, and analysed using an Xrite i1i0 Advanced Scanning Table. Density was measured using an X-Rite ExactXP densitometer.

Test Environment/Conditions

All testing was conducted in a controlled environment at Buyers Lab's test facility located at Unit 11, The Business Centre, Molly Millars Lane, Wokingham, RG41 2QZ per the following conditions:

- A. Temperature was maintained at 22°C, +/-2.7°C with daily conditions monitored and logged 24/7 by a Seven-Day Temperature/Humidity Chart Recorder.
- B. Relative humidity was maintained within 45% +/- 10% with daily conditions monitored and logged 24/7 by a Seven-Day Temperature/Humidity Chart Recorder.
- C. Materials conditioning: Printers, paper and cartridges were acclimatized to the above conditions for a minimum of 24 hours prior to testing. Prior to acclimatization, packaging and shipping materials were opened in a manner that prevented light damage from occurring to the print cartridge during acclimatization. Paper was acclimatized in a ream wrapper.

About Keypoint Intelligence - Buyers Lab

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

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

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