

Comparative Performance Testing

DECEMBER 2019

Canon PIXMA G6050 versus Device A and Device B Image Quality Test

Test Objective

Keypoint Intelligence - Buyers Lab was commissioned by Canon Europe Ltd. to conduct a comparative image quality evaluation of the Canon PIXMA G6050 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 device with that of Devices A and B. The three test devices were operated in Standard (default) mode and Eco (draft) mode when printing on budget and premium paper, 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 G6050 is also sold as the Canon PIXMA G6040, so this report is also applicable to that device.

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 G6050 was the clear leader.

In Eco/Draft mode, Devices A and B's photographic image quality was washed out and grainy, with poor detail, with Device B's image quality being worse than Device A's. The Canon PIXMA G6050's was superior, with clearly defined text that was legible all the way down to 3-pt. text, for example, and high-quality photographic images and skin tones. The Canon PIXMA G6050 also had the highest average CIE colour gamut when printing in Eco and Standard modes.

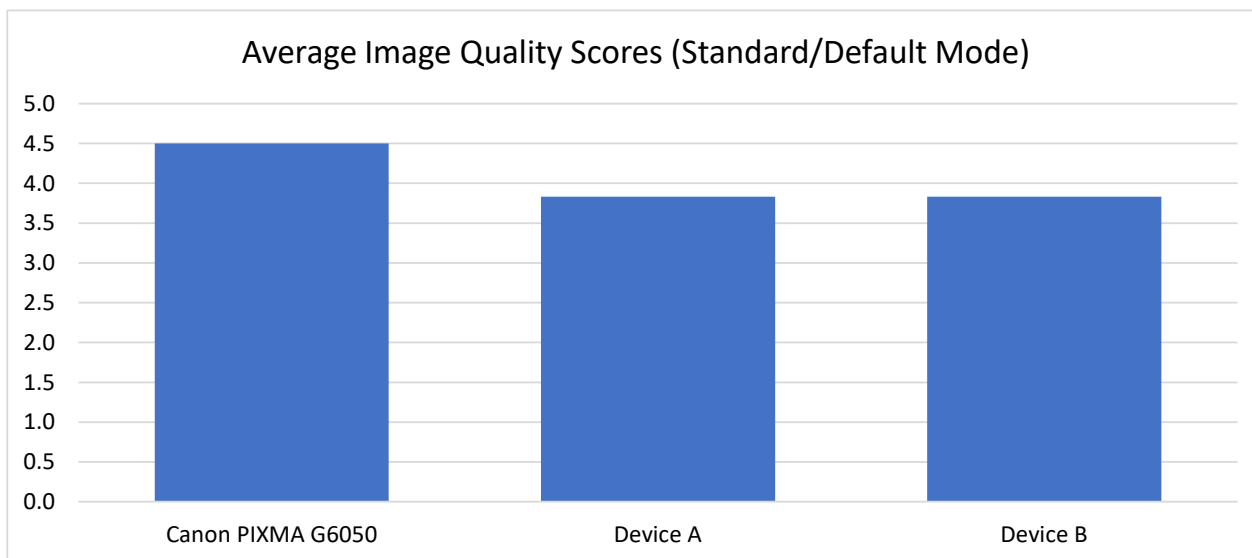
Overall, the Canon PIXMA G6050 provides the best image quality in both Eco/Draft and Standard modes. If great image quality is of paramount concern in all situations, then of the three devices tested the Canon PIXMA G6050 is the device to choose.

Image Quality

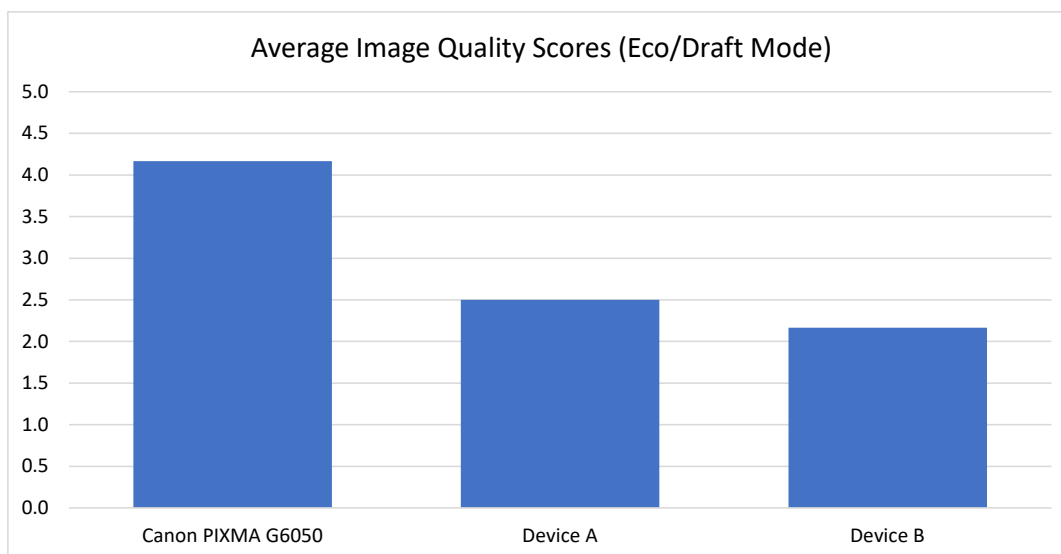
Using a range of proprietary test targets, Buyers Lab assessed the devices' image quality from a variety of perspectives, including optical density, text, fine lines, photographic image reproduction, and colour gamut volume. All tests were conducted in Standard and Eco modes on all devices. Two types 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 80 gsm 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.

- In Standard mode, the Canon's average image quality score was 17% higher than Device A and B's.
- In Eco mode, the Canon's average image quality score was 67% and 92% higher than Device A and Device B, respectively.

Overall Image Quality Scores



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 G6050	Device A	Device B
Draft Mode Budget	25	15	13
Draft Mode Premium	25	15	13
Standard Mode Budget	27	23	23
Standard Mode Premium	27	23	23
Best Quality Mode Glossy	30	25	25

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 Mode

- The Canon PIXMA G6050 produced the best Arial and Times New Roman text quality. Characters had more definition and were more legible than those produced by Devices A and B (the difference was very pronounced in Times New Roman). Times New Roman and Arial text was legible down to 3-pt. size, which is the smallest on the target.
- Device A's text was legible at 8-pt. size only when viewed with the naked eye. As an example, the label "4pt" wasn't discernible (4-pt. size). Device A's Arial text was better defined than its Times New Roman text.
- Device B's text was poorly formed, and this had a big impact on legibility, with 8-pt. text being the smallest legible size. Text was heavily broken, especially in Times New Roman.

- The Canon's fine lines and dots (all of which were present) were judged to be Very Good. However, Device A and B's dots were poor, with some completely missing and others in odd patterns that made them not appear to be dots.

In Standard Mode

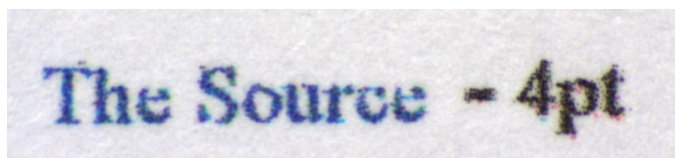
- The Canon PIXMA G6050 still had the most clearly defined text. It was legible to 3-pt. size but had some minor breaks, and for that reason was deemed Very Good rather than Excellent.
- Device A's Times New Roman text was less well-defined but darker than the Canon's, and much improved over its text in Eco mode. At the same time there were breaks in the text that further reduced legibility.
- Device B's text was much improved over output in Eco mode. Device B's text was better defined than the Device A's and Canon G6050's text in some areas but not in others. The text of all three was on par.
- Device A and B's dots were still unsatisfactory, as some dots were missing in wide, cross-like bands. In contrast, the Canon's dots were of a similar quality to those it printed in Eco mode.

In Best Mode

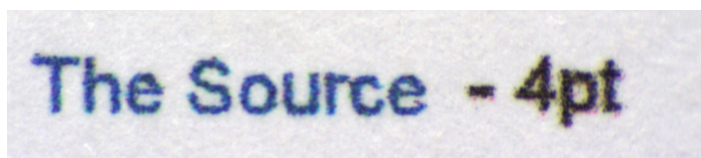
- When printing on glossy paper, all three devices were rated Excellent for text reproduction

Text Quality Examples – Eco/Draft Mode, 80 gsm Premium Paper

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



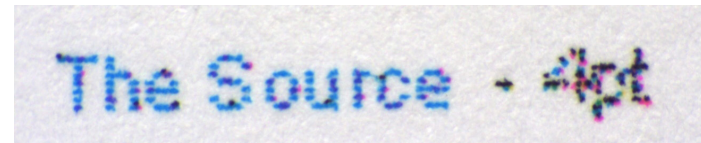
Canon PIXMA G6050 Times New Roman



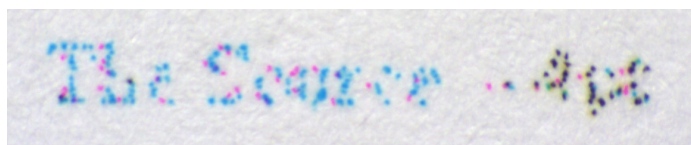
Canon PIXMA G6050 Arial



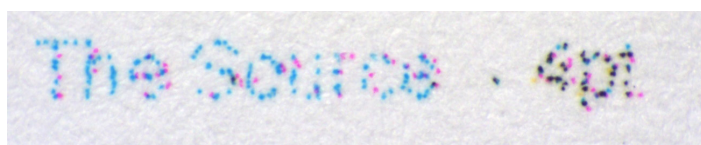
Device A Times New Roman



Device A Arial



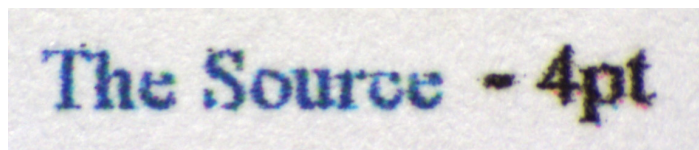
Device B Times New Roman



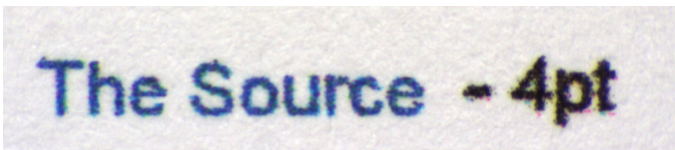
Device B Arial

Text Quality Examples – Standard/Default Mode, 80 gsm Premium Paper

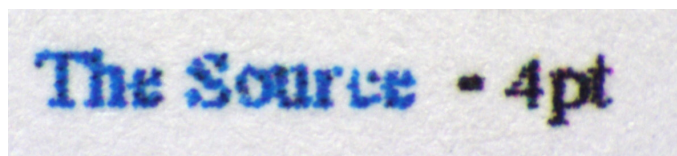
The magnified samples below show 4-pt. text when printed on 80 gsm premium paper.



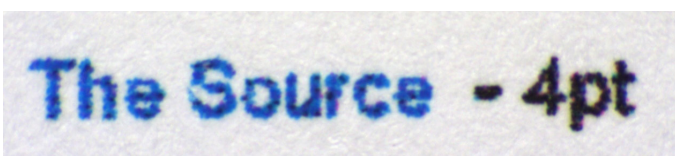
Canon PIXMA G6050 Times New Roman.



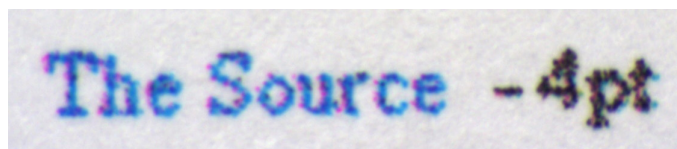
Canon PIXMA G6050 Arial.



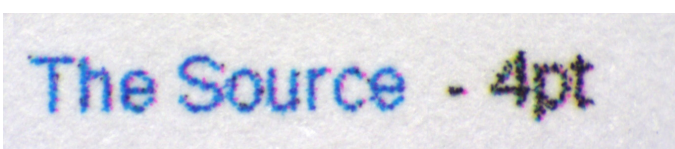
Device A Times New Roman



Device A Arial



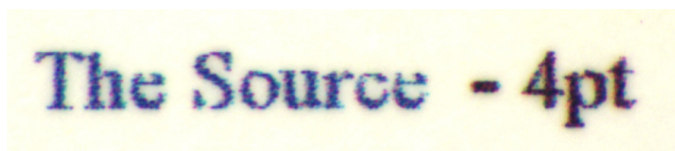
Device B Times New Roman



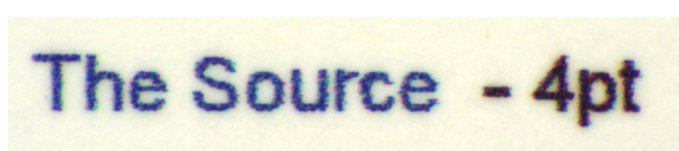
Device B Arial

Text Quality Examples – Best Quality Mode, 180 gsm Photo Paper

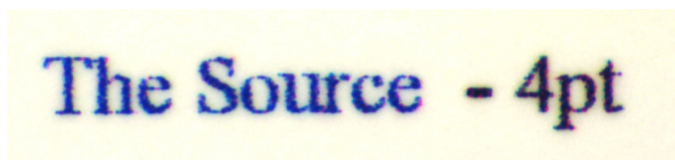
The magnified samples below show 4-pt. text when printed on 180 gsm photo paper.



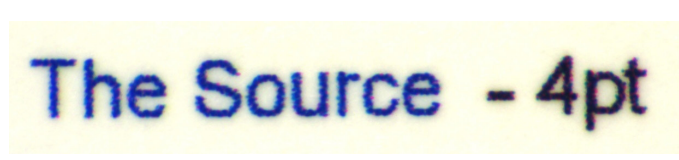
Canon PIXMA G6050 Times New Roman



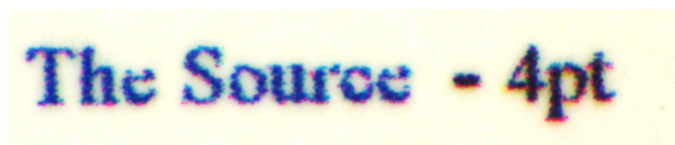
Canon PIXMA G6050 Arial



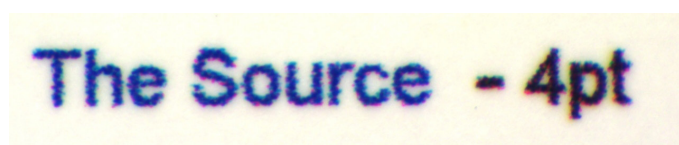
Device A Times New Roman



Device A Arial



Device B Times New Roman

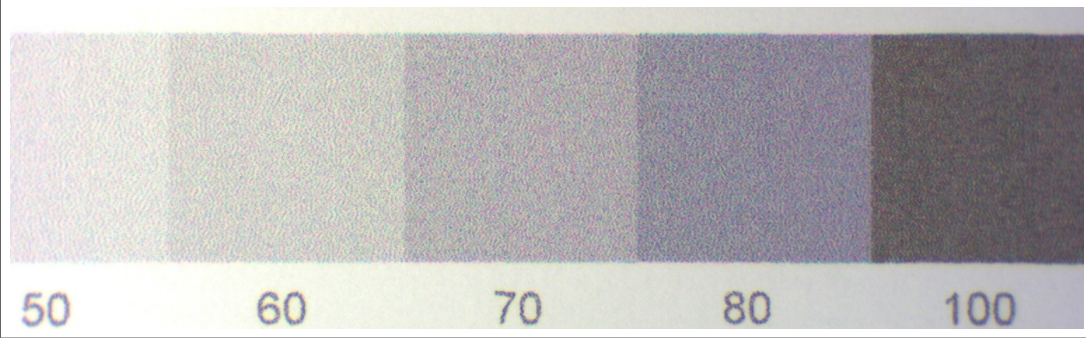
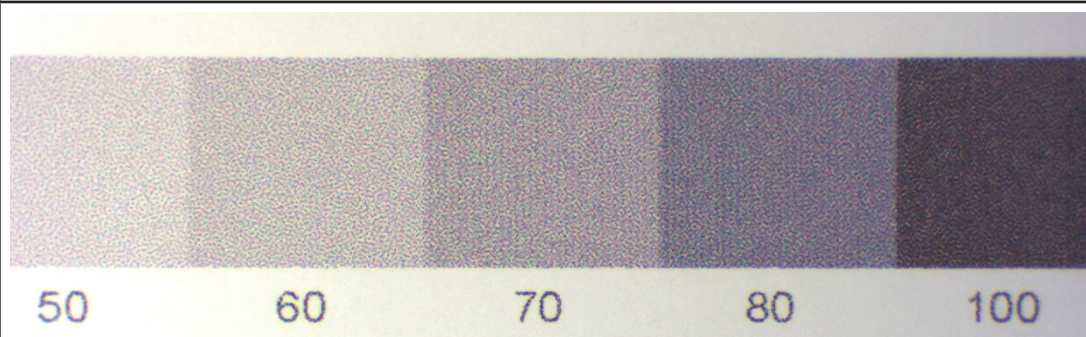
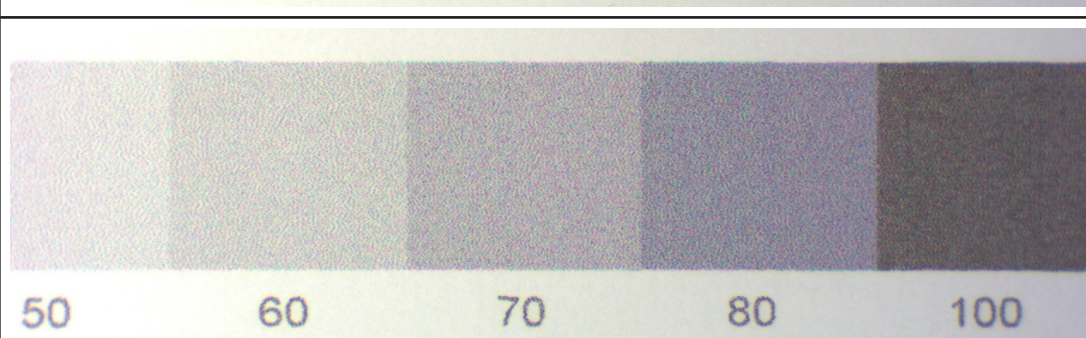


Device B Arial

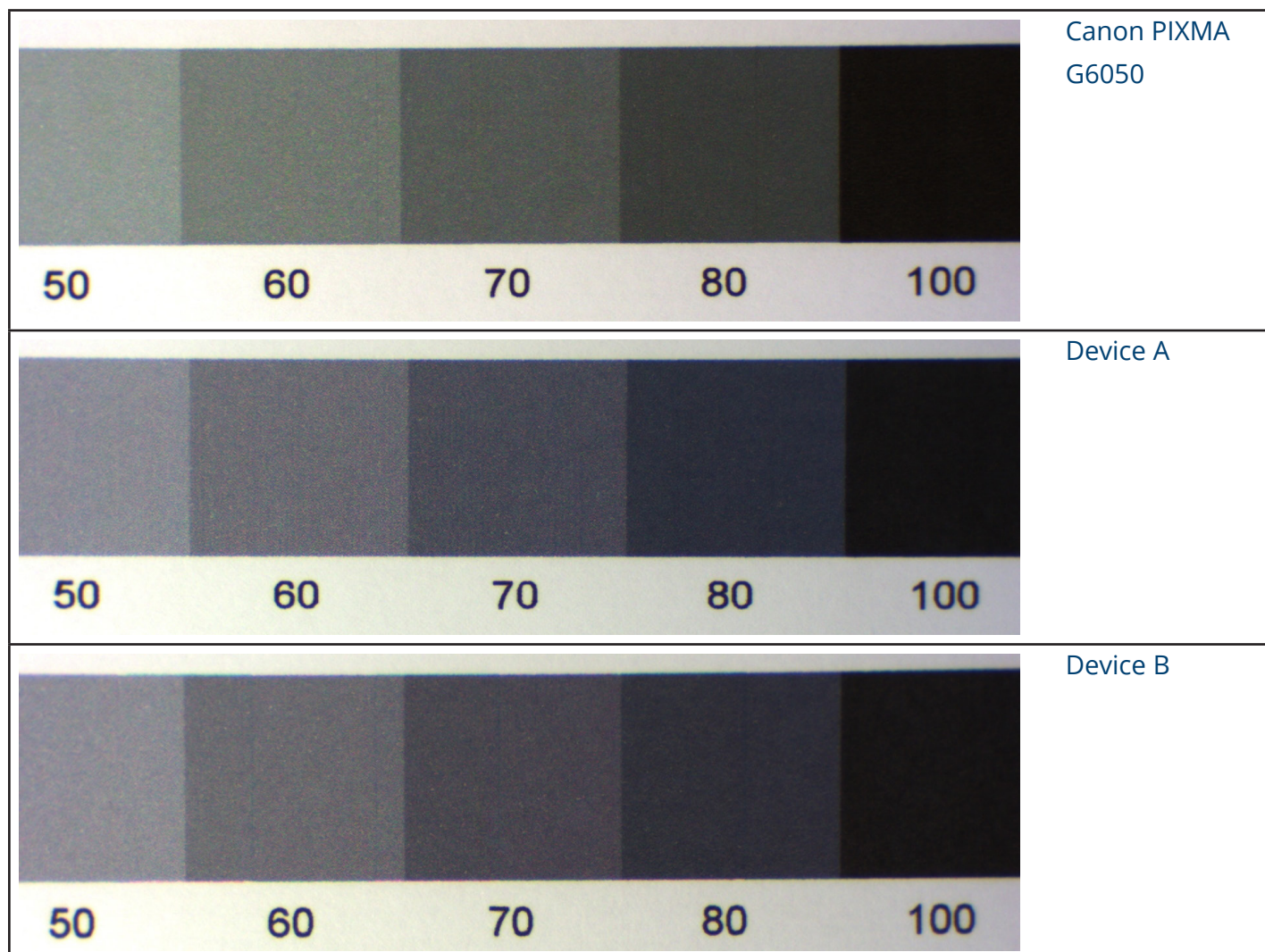
Halftone Fill Coverage

- Although there was clear distinction between the full 10% to 100% dot-fill range for all three devices when printing in Eco mode, the halftone fills of Device A and B were much lower quality than those of the Canon PIXMA G6050, which were deemed to be Very Good.
- In Eco mode, Device A produced halftones that were too light, and this was especially noticeable at the lighter end of the range. Plus, its fills were mottled and were not a uniform grey colour. Device B suffered from the same deficiencies and its halftones were lighter than those of Device A.
- In Standard mode, all devices' halftones were deemed to be Very Good.

Halftone Fills (Eco Mode, 80 gsm Premium Paper)

	<p>Canon PIXMA G6050</p>
	<p>Device A</p>
	<p>Device B</p>

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



Subjective Photographic Image Quality

- In Eco mode, Device A and B's image quality was Poor. Colours were too light, images were washed out, and, as a result, detail suffered. In contrast, the Canon PIXMA G6050's photo images had great detail, with rich, vivid colours.
- In Standard mode Device A and B's photo output was deemed to be Very Good, while the Canon's was Excellent. Device A and B's output was grainy and the contrast wasn't as good as the Canon's. This was also the case in best quality mode on glossy paper.
- Device A and B's skin tones were poorly produced compared to the Canon's in Eco mode; the latter's skin tones were more natural and a better match to the test target's.
- Device A and B's skin tones were still not as natural or as close a match to the test target as the Canon's, but they were a marked improvement over their Eco mode output.

Examples from the Original Photographic Image and Skin Tones Test Targets



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



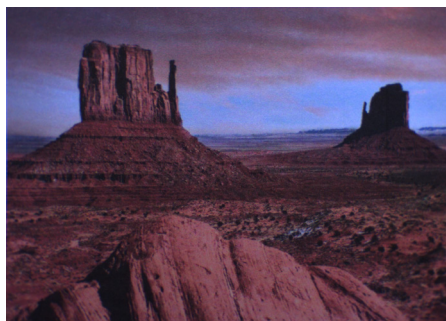
Canon PIXMA G6050



Device A



Device B



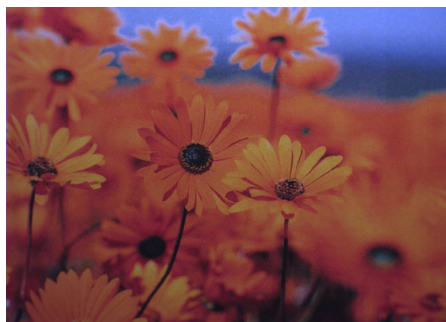
Canon PIXMA G6050



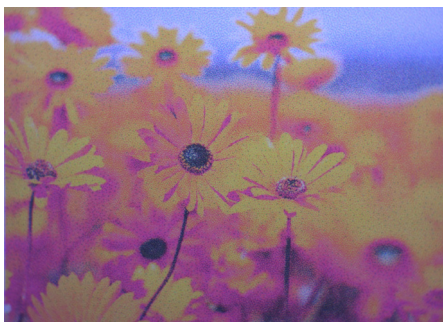
Device A



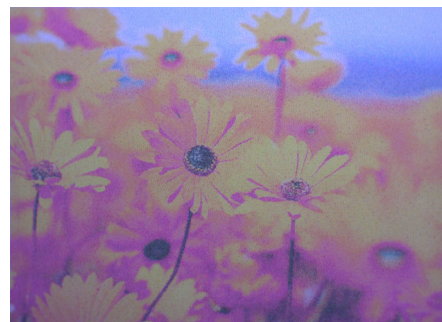
Device B



Canon PIXMA G6050



Device A



Device B

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



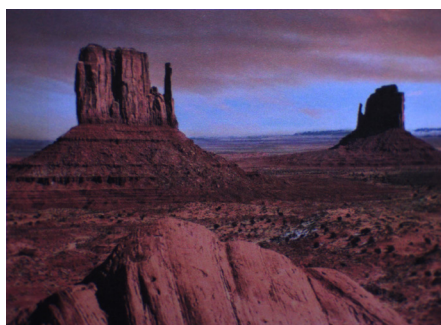
Canon PIXMA G6050



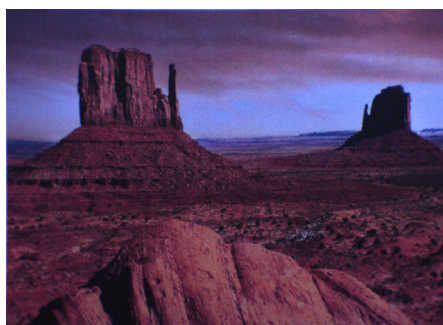
Device A



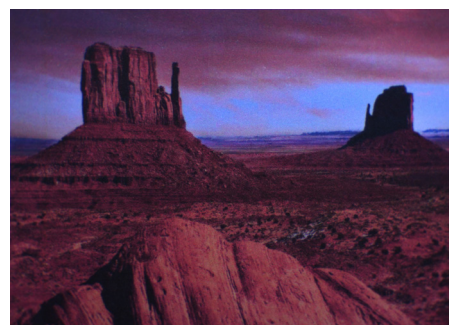
Device B



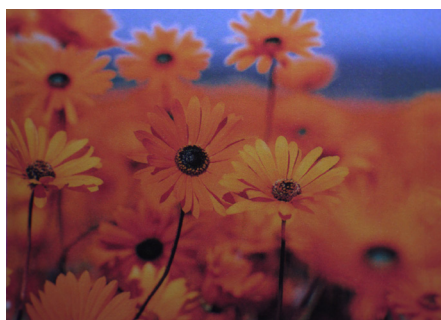
Canon PIXMA G6050



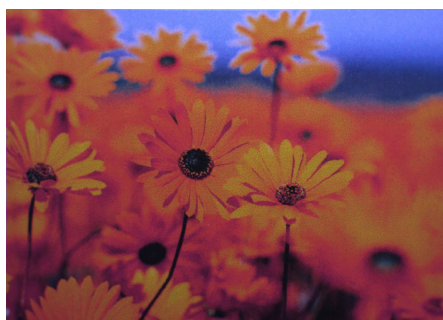
Device A



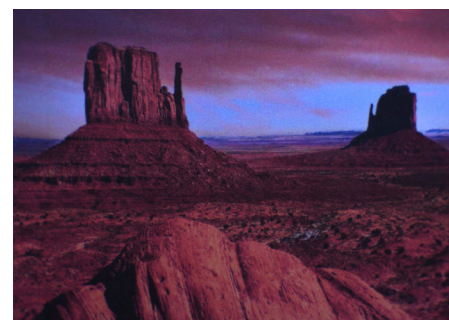
Device B



Canon PIXMA G6050



Device A



Device B

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



Canon PIXMA G6050



Device A



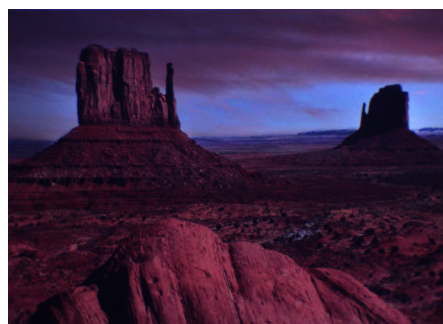
Device B



Canon PIXMA G6050



Device A



Device B



Canon PIXMA G6050



Device A



Device B

Skin Tone Quality (Eco Mode, Premium Paper)



Canon PIXMA G6050



Device A



Device B

Skin Tone Quality (Standard Mode, Premium Paper)



Canon PIXMA G6050



Device A



Device B

Skin Tone Quality (Best Quality Mode, Glossy Paper)



Canon PIXMA G6050



Device A

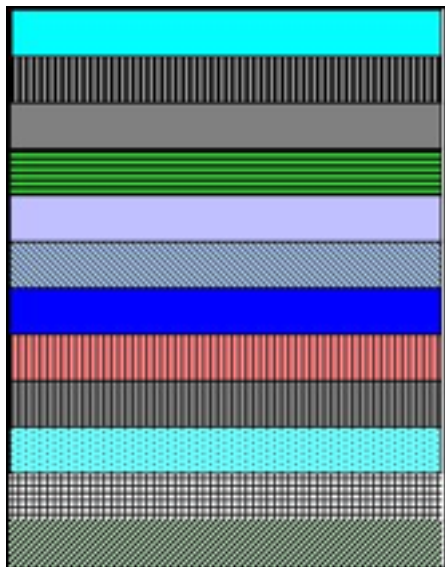


Device B

Colour Business Graphics Reproduction

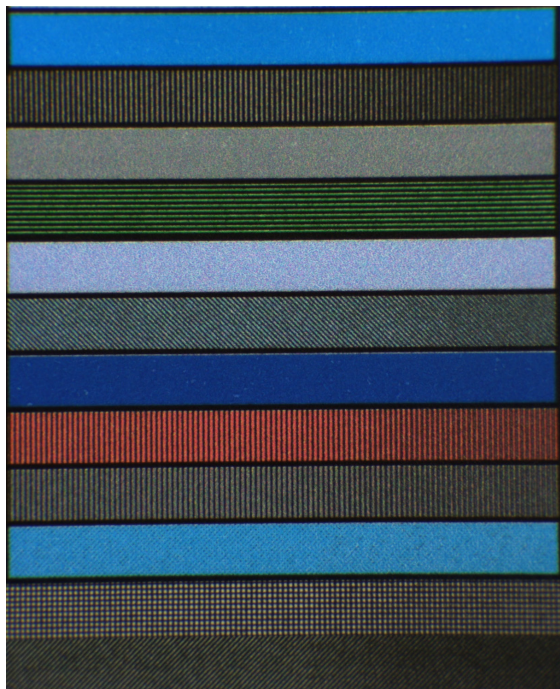
Using an industry-standard KATUN test document and proprietary test targets, Buyers Lab assessed business graphics output produced by each device when using budget, premium, and glossy photo paper in Standard mode.

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

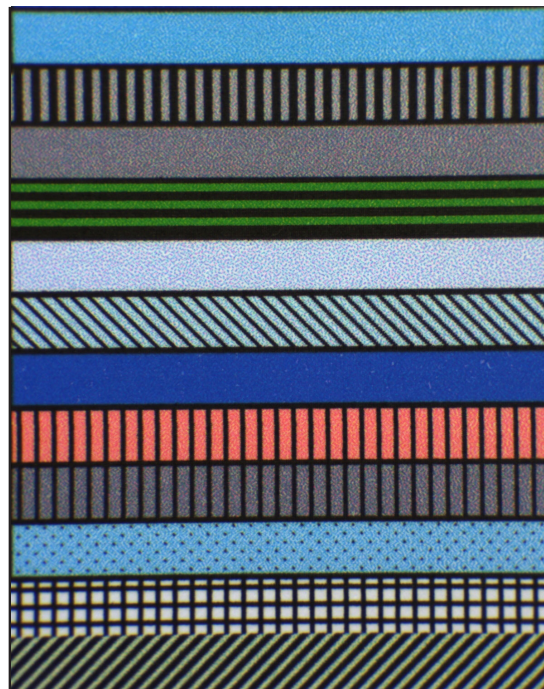


Sample from the Business Colour Graphic Excel Test File

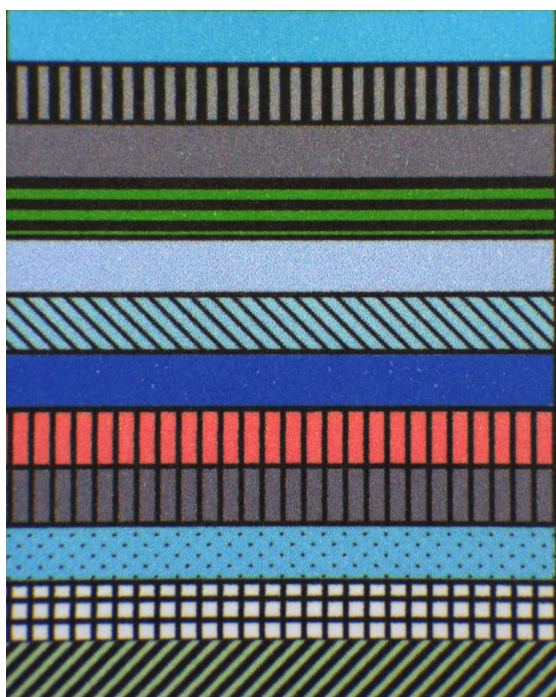
Business Colour Graphics (Standard Mode, Premium Paper)



The Canon PIXMA G6050 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.



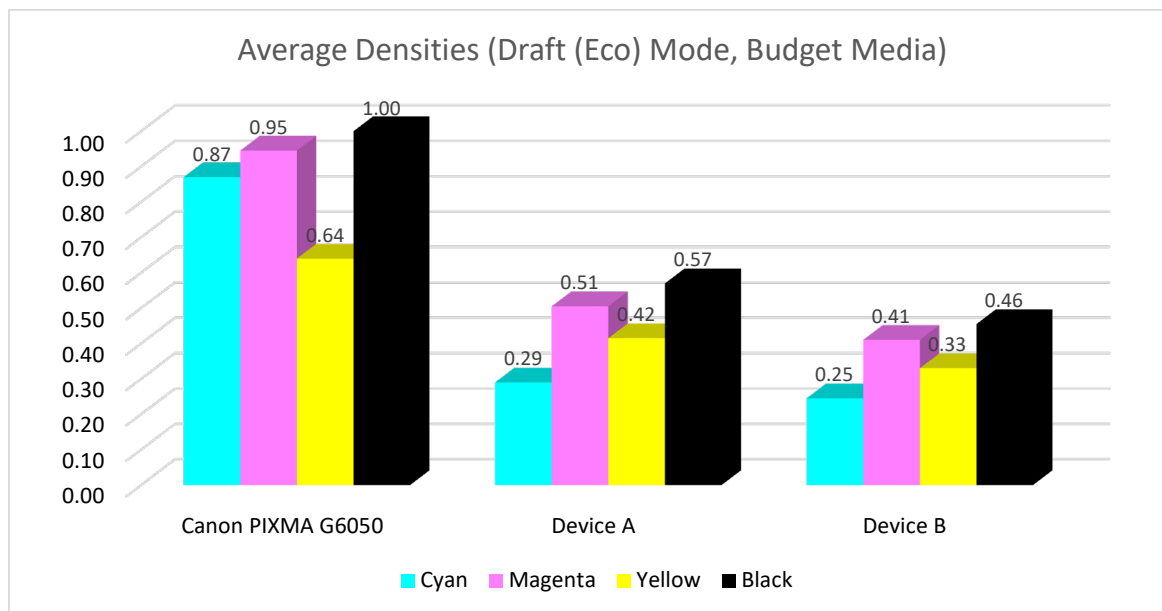
Device A did a good job of reproducing the colours and fill patterns, but it isn't perfect because the bars in the fill patterns are too thick.



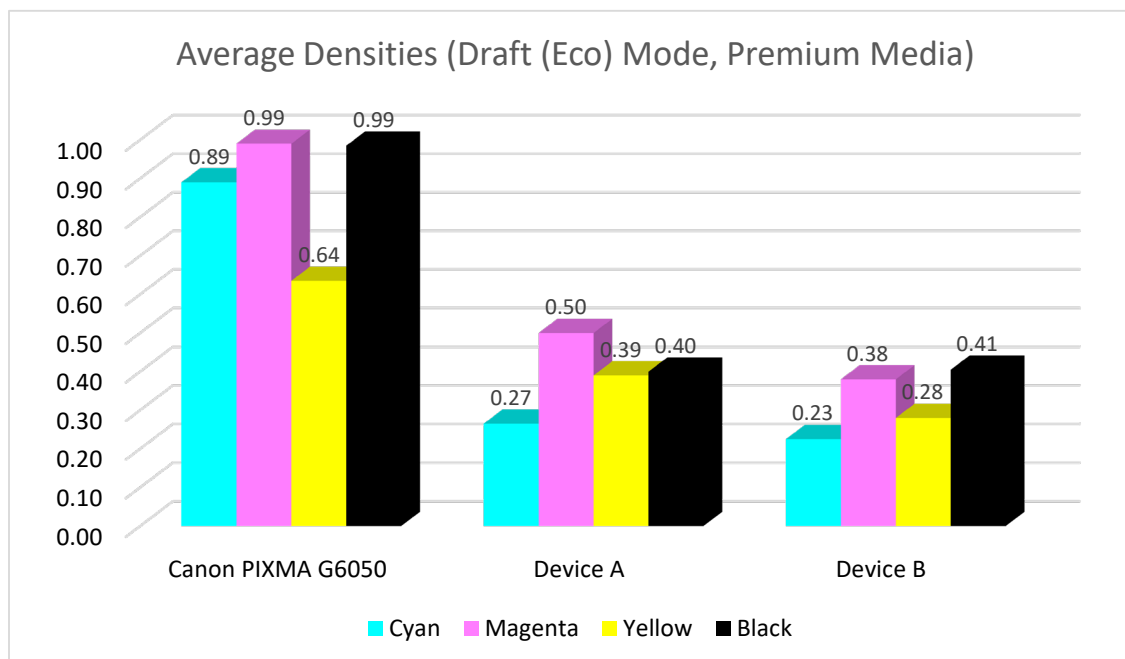
Device B did a good job of reproducing the colours and fill patterns, but with the latter the bars are too thick.

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.

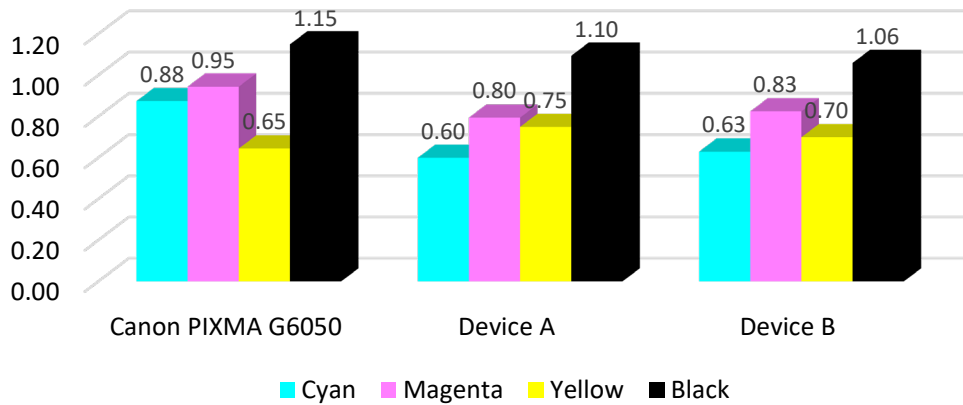


Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on budget paper in Eco mode.



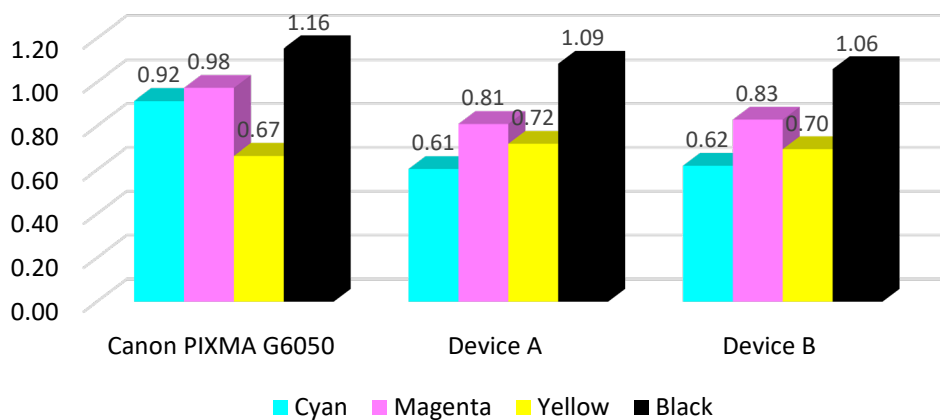
Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on premium paper in Eco mode.

Average Densities (Standard (Default) Mode, Budget media)

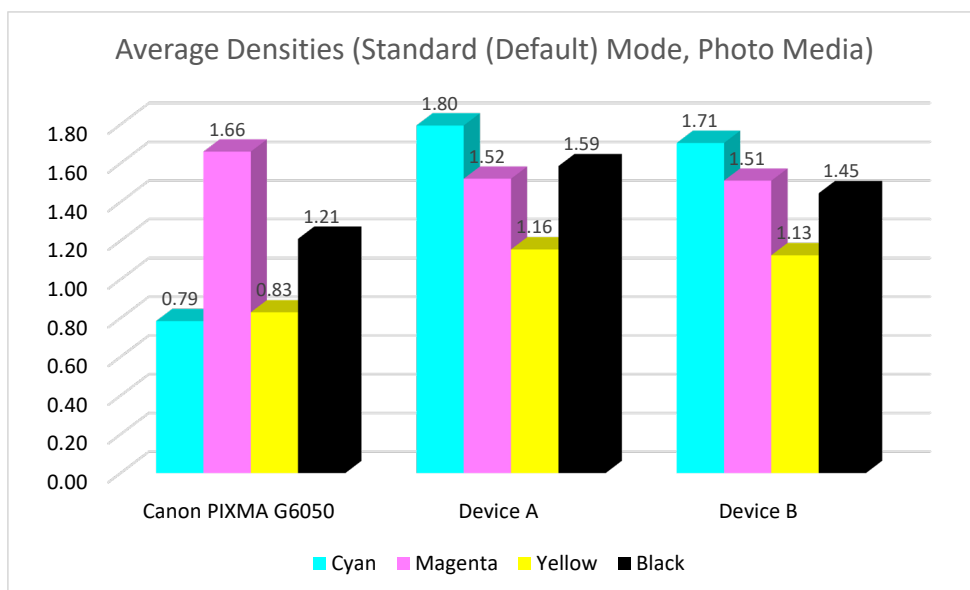


Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on budget media in Standard mode.

Average Densities (Standard (Default) Mode, Premium Media)



Average densities of each colour are calculated based on two readings for black and two readings for each colour, using output printed on premium media in 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 default mode.

Average Density (Eco/Fastest Mode)

	Budget				Premium			
	C	M	Y	K	C	M	Y	K
Canon PIXMA G6050	0.87	0.95	0.64	1.00	0.89	0.99	0.64	0.99
Device A	0.29	0.51	0.42	0.57	0.27	0.50	0.39	0.40
Device B	0.25	0.41	0.33	0.46	0.23	0.38	0.28	0.41

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 G6050	0.88	0.95	0.65	1.15	0.92	0.98	0.67	1.16	0.79	1.66	0.83	1.21
Device A	0.60	0.80	0.75	1.10	0.61	0.81	0.72	1.09	1.80	1.52	1.16	1.59
Device B	0.63	0.83	0.70	1.06	0.62	0.83	0.70	1.06	1.71	1.51	1.13	1.45

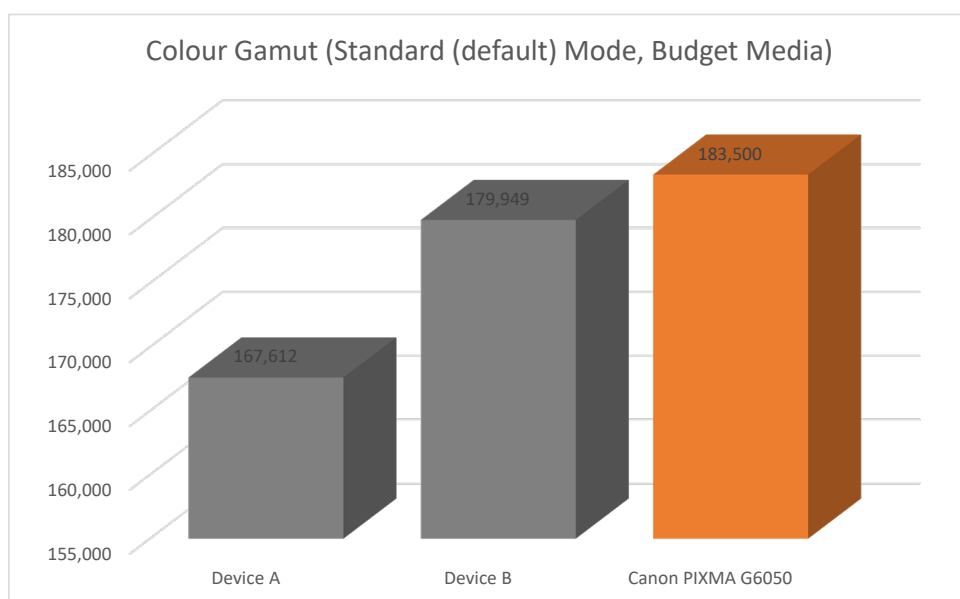
Average CMYK densities of each device tested in default mode are calculated based on two readings for black and two readings for each colour, using output on budget, premium, and photo paper. A higher number indicates darker output.

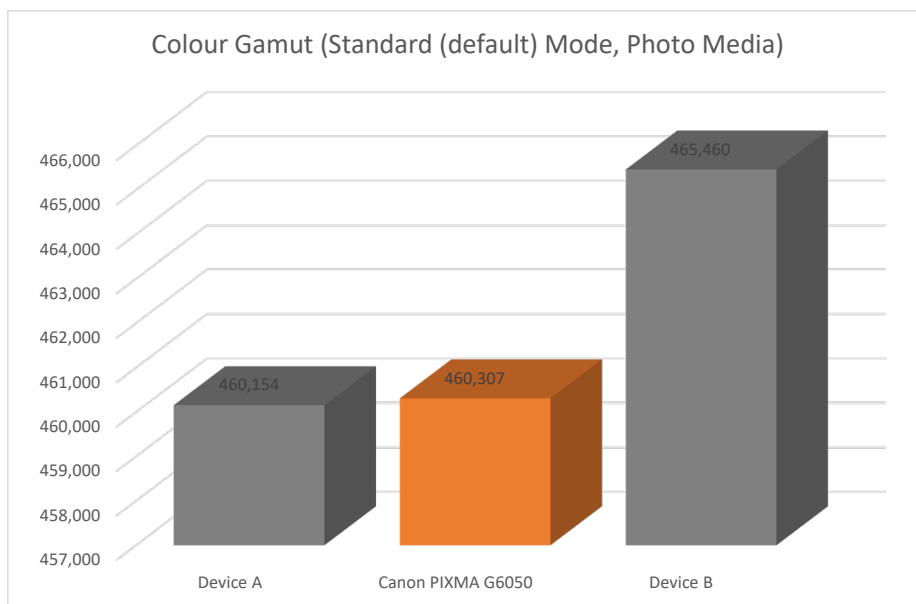
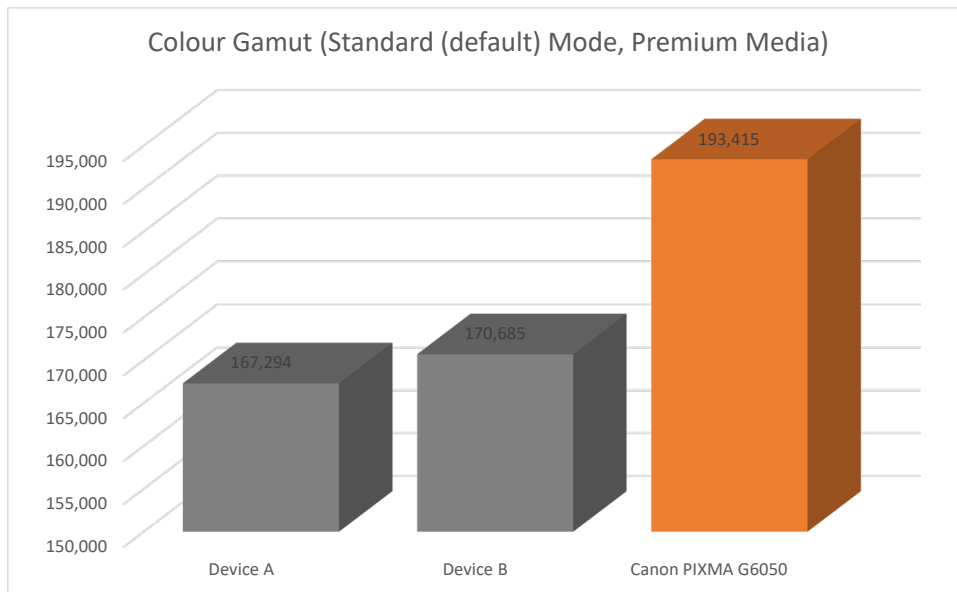
Colour Gamut

Setting	Media	Canon PIXMA G6050	Device A	Device B
Standard	Budget	183,500	167,612	179,949
	Premium	193,415	167,294	170,685
	Photo	460,307	460,154	465,460

Colour gamut was only tested in Standard mode.

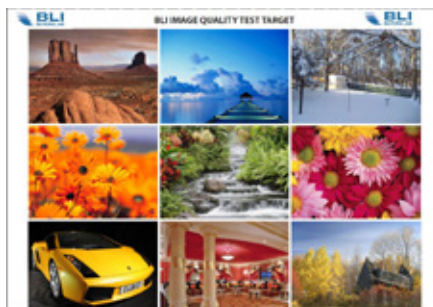
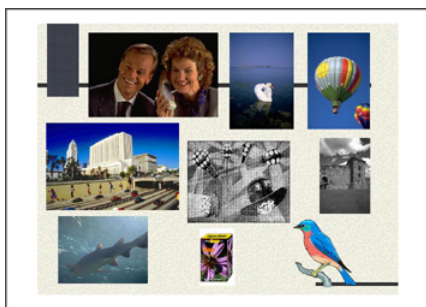
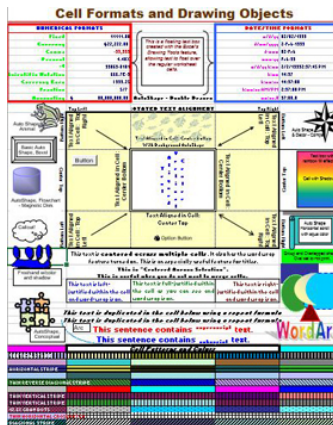
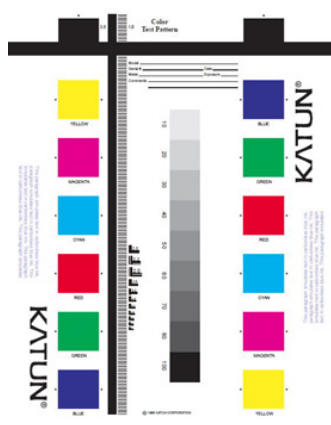
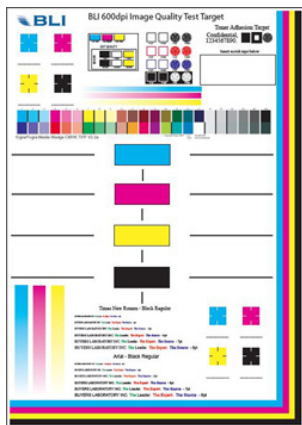
- The Canon PIXMA G6050's output had the highest CIE reading when printed on budget and premium media. However, its colour gamut reading on photo paper was only slightly higher than that of Device A, and 1.1% lower than that of Device B.
- When printed on budget media, the Canon PIXMA G6050's output had a reading that was 9.5% and 2.0% higher than that of Device A and Device B, respectively.
- When printed on premium media, the Canon PIXMA G6050's output had a reading that was 15.6% and 13.3% higher than that of Device A and Device B, respectively.





Supporting Test Data

Buyers Lab used a variety of proprietary image quality test files in this test to test the Canon PIXMA G6050 inkjet printer, Device A and Device B. 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 G6050	Device A	Device B
Eco	Budget	Text	5	2	2
		Line Art	4	2	2
		Halftone Range	4	3	2
		Halftone Pattern	4	3	3
		Photographic Images	4	2	2
		Business Graphics	4	3	2
		TOTAL	25	15	13
Eco	Premium	Text	5	2	2
		Line Art	4	2	2
		Halftone Range	4	3	2
		Halftone Pattern	4	3	3
		Photographic Images	4	2	2
		Business Graphics	4	3	2
		TOTAL	25	15	13
Standard	Budget	Text	4	4	4
		Line Art	4	3	3
		Halftone Range	5	4	4
		Halftone Pattern	5	4	4
		Photographic Images	5	4	4
		Business Graphics	4	4	4
		TOTAL	27	23	23
Standard	Premium	Text	4	4	4
		Line Art	4	3	3
		Halftone Range	5	4	4
		Halftone Pattern	5	4	4
		Photographic Images	5	4	4
		Business Graphics	4	4	4
		TOTAL	27	23	23
Standard	Gloss Photo	Text	5	5	5
		Line Art	5	4	4
		Halftone Range	5	4	4
		Halftone Pattern	5	4	4
		Photographic Images	5	4	4
		Business Graphics	5	4	4
		TOTAL	30	25	25

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:

Media Type			
Device	Budget	Premium	Photo
Canon PIXMA G6050	Staples copy paper A4, 80gsm	Canon Red Label Presentation A4, 80gsm	Staples Everyday Photo Quality Paper (Glossy), 180 gsm
Device A	Staples copy paper A4, 80gsm	Canon Red Label Presentation A4, 80gsm	Staples Everyday Photo Quality Paper (Glossy), 180 gsm
Device B	Staples copy paper A4, 80gsm	Canon Red Label Presentation A4, 80gsm	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