



Consumables Evaluation Report

A comparative analysis of OKI Printing Solutions Original printer cartridges versus third party brands with excerpts from independent tests conducted by Buyers Laboratory Inc.



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This document has been prepared by OKI Printing Solutions using excerpts and data from comparative evaluation reports commissioned from BLI. All data and excerpts directly from the BLI reports are clearly identified. All other comments made within the document are OKI's conclusions and interpretations of said data.

Introduction

This document forms the second in a series of reports that evaluate OKI Printing Solutions Original Consumables against non-genuine competitor products. The text has been prepared by OKI Printing Solutions. Test data and various images have been supplied by BLI.

Our first set of tests, comparing Original toner cartridges against certain compatible offerings was conducted in-house by OKI Printing Solutions. This second evaluation was conducted externally by an independent test laboratory.

OKI Printing Solutions commissioned Buyers Laboratory

Inc. (BLI) to carry out its external evaluation. BLI is the imaging industry's leading independent authority and provider of competitive intelligence, testing and reviews on multifunction (MFP), copier, printer, scanner and software solutions and products.

The aim of this report is to provide objective information and conclusions – supported by data supplied by BLI – to assist our resellers and end-users make informed decisions about buying Original or third party toner cartridges for use with OKI printer hardware.

Test objective

To conduct comparative tests of toner cartridges for use with OKI Printing Solutions C5900 colour printers. Cartridges tested included OKI Printing Solutions own brand Original Consumables and non-genuine supplies comprising leading compatible and remanufactured cartridges.

All cartridges were tested under environmentally controlled conditions for yield, reliability and image quality. The performance results of OKI Printing Solutions Original Consumables were compared against those of the non-genuine competitor vendors.



Key findings of external testing

BLI reported that OKI Printing Solutions Original toner cartridges delivered a higher average toner yield than the competitor cartridges across the CMYK range – with one exception. In OKI's opinion that particular vendor's cartridges were overfilled to create the illusion of value for money.

During the testing, OKI Printing Solutions Original cartridges performed at 100% reliability.

For image quality, Oki Printing Solutions outperformed all competitor cartridges particularly in the areas of grey scale, text reproduction, halftones, different paper weights and general overall appearance of colour output.

In OKI's opinion and supported by the coming details, OKI Printing Solutions Original Consumables were adjudged to offer superior levels of reliability and consistency against the competitor cartridges on test.



Scenario

For the purposes of the test, five OKI C5900 printers were used: one for OKI Printing Solutions Original Consumables and the others for each of the four competitor toner cartridges. A description of the products under evaluation is shown below.

Brands and products under assessment in the evaluation

Brand	Type	Classification	Product
OKI Printing Solutions	OEM	Original	C5900
MediaSciences	Non-genuine	New compatible	C5900
Katun	Non-genuine	Remanufactured	C5900
Xprint	Non-genuine	Remanufactured	C5900
*Q Imaging	Non-genuine	Remanufactured	C5900

Each of the non-genuine supplies is an established European brand. MediaSciences is a leading compatible brand; the three other suppliers are leading remanufacturers. For the purposes of the evaluation, OKI Printing Solutions wanted to pitch its Original product against third party suppliers who were leaders in the non-genuine European market.

A total of 12 cartridges, comprising three sets of CMYK, from each supplier were to be used in individual face-offs against the 12 Original OKI Printing Solutions toner cartridges.

A4 paper was used throughout the testing with different paper weights, ranging from 80gsm to 190gsm, being introduced at predetermined stages of the evaluation.

Compatibles

Usually toner cartridges (and other imaging supplies) that are newly manufactured and sold via dealerships, independents or Internet sites as “own brand” products.

Remanufactured

Mostly toner cartridges (and some other imaging supplies) that started life as either a new Original or a new compatible that has been rebuilt or reused one or more times. These may or may not have had components replaced.

Compatible and remanufactured cartridges use a generic toner powder. OKI Printing Solutions uses its OEM toner, which is specifically formulated to work with maximum efficiency, performance, and quality with the appropriate OKI Printing solutions printer hardware.

* BLI were instructed to exclude Q Imaging from their evaluation, the reasons for this will be explained in the coming pages

Pre-test inspection

Prior to testing, external and internal product packaging was inspected for damage and toner leakage respectively during transit. No issues were reported with OKI Printing Solutions Original Consumables. One MediaSciences magenta cartridge was leaking toner upon unpacking and was rejected. Otherwise, BLI noted that there were no issues with the competitor brands.

As part of our original proposal, we wanted to evaluate four competitors: one well known Compatible supplier and three well known Remanufacturers. Unfortunately due to problems found with one of the Remanufacturers products this was not possible.

During OKI's internal pre-selection process, we purchased and inspected toners from Q Imaging, but when a set was inserted, the printer would not work and it displayed error messages. On closer inspection it was discovered that the RFIDs were missing from all four toner cartridges. We then inspected the remaining four sets of toners and found that they too did not have RFIDs fitted.

Q Imaging Cyan image drum forced open after 1,000 pages through incorrect positioning of centre post (Source – OKI Printing Solutions)

At this stage, all toner cartridges were returned to Q Imaging who apologised, reworked (inserted RFIDs) and returned them. During a second attempt to run a set of these cartridges, after approximately 1,000 pages the drum gears ground to a halt and burst the side of the Cyan drum housing. A similar event occurred shortly after with the Magenta drum. On inspection we found that the centre post seating pin was misplaced and as such put excessive pressure on the drum gears and housing causing this damage. We concluded that all of the recently returned, reworked, cartridges had their centre posts misplaced too.

At this point we decided to strip and recycle all of the Q Imaging product to eliminate them from the evaluation, therefore BLI were instructed to evaluate and report on only Media Sciences, Katun, X Print and OKI product. In an attempt to bring you what we originally intended we have commissioned BLI to source and evaluate Q Imaging product and we will update you as to how they fared in due course.



Q Imaging centre post in incorrect position (Source – OKI Printing Solutions)



OKI Printing Solutions Original Consumable centre post in correct position (Source – OKI Printing Solutions)

Overview of page yield results

With the exception of a higher Black yield from one competitor (See Note 1 and Note 2 below), OKI Printing Solutions outperformed all non-genuine supplies in terms of page yield. This was especially noticeable in colour where our average yield was in excess of all third parties. Compared to the poorest competitor, OKI Printing Solutions colour page yield was more than 19% higher.

BLI's reports showed that:

- Against MediaSciences, OKI Printing Solutions delivered a higher average toner yield with a 46.3% advantage in K (Black) and 15.0% advantage in CMY (cyan, magenta and yellow). MediaSciences failed to meet its specified Black page yield. Two cartridges failed prematurely and a third was dead on arrival
- Against Katun, OKI Printing Solutions delivered a higher average toner yield with an 18.3% advantage in K (Black) and 19.5% advantage in CMY
- Against Xprint, OKI Printing Solutions delivered a slightly lower yield on Black (43 pages less) but a higher average yield (141 pages more) with CMY cartridges

Note 1

BLI weighed all toner cartridges prior to testing and on toner exhaustion. It was found that there was a variance in powder content and toner weight with Xprint's Black cartridges. In separate evaluations, OKI Printing Solutions have noted that some non-genuine suppliers try to gain a page yield advantage by overfilling.

Furthermore, OKI Printing Solutions toner cartridges have been designed to operate effectively and deliver appropriate page yields with specific maximum and minimum amounts of toner and to introduce additional quantities of toner may give rise to toner flow and clumping problems as well as placing excessive stress on moving parts.

Note 2

- Manufacturers' claimed page yields are based on 5.0% coverage of A4
- Identical files were used for print assessment across all products tested. Yield was determined by using a five-page test suite as specified in ISO 24712

Note 3

Although Xprint outperformed OKI Printing Solutions Black cartridge yield by 43 pages, in our opinion this should be taken in context and considered with Xprint's shortcomings in image quality (as described in the section on Image Quality Results, page 9) and overfilling on average by around 9% which should equate to an additional 540 pages, not 43.

Observations on reliability levels

Reliability was assessed throughout the testing and incidents of cartridge malfunctions, out-of-box failures, operation failures, toner leakage, drum flaws as well as printer malfunctions caused by cartridges were recorded.

BLI's reports showed that:

- OKI Printing Solutions Original cartridges were stated as 100% reliable and met or exceeded the OEM's page yield specification
- Two of the twelve MediaSciences cartridges (one Black and one Magenta) experienced a premature failure. On both occasions the printer indicated that the cartridge was empty – even though there was sufficient powder in the cartridge
- Overall, Katun cartridges recorded 100% reliability. However, two of the cartridges under test were found to be noisy. Closer inspection indicated that these cartridges were formerly used for Yellow toner but subsequently had been refilled and supplied with Black toner

- Xprint recorded 100% reliability levels and exceeded specification on Black page yield. However, in the opinion of OKI Printing Solutions this was attributed to excessive toner filling
- Q Imaging, as stated previously, were not tested to capacity as they were withheld from BLI testing due to the initial critical failings so are recorded as having zero reliability

OKI Printing Solutions believes that although the Katun and Xprint cartridges demonstrated 100% reliability, the two Yellow cartridges refilled with Black (from Katun) and the variation in toner content levels (from Xprint) suggest a lack of credibility in consistency and quality control processes.

Halftone reproduction

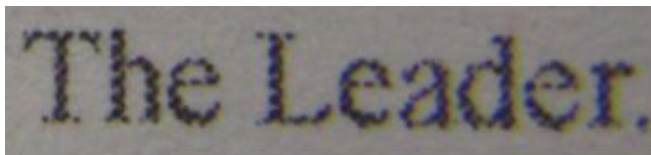
BLI's reports showed that:

- Against MediaSciences, very dark contrasts were reproduced better with OKI Printing Solutions Original toner; very light contrasts were comparable
- Against Katun, very dark and very light contrasts were reproduced better with OKI Printing Solutions Original toner
- Against Xprint, very dark and very light contrasts were reproduced better with OKI Printing Solutions Original toner

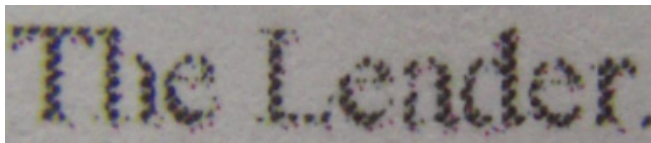
Text reproduction

BLI reported that text reproduction using OKI Printing Solutions Original toner showed a clear advantage over the non-genuine cartridges tested – especially with serif fonts which exhibited cleaner character formation.

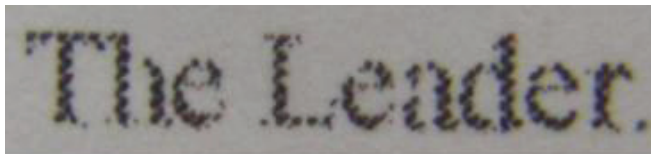
This was particularly evident when reproducing small fonts. The images below are enlarged photographs of a text extract printed at 5-point Times New Roman on 100gsm colour laser stock.



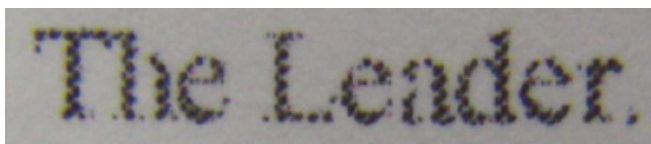
*OKI Printing Solutions
5pt text
(Source – BLI)*



*Katun
5pt text
(Source – BLI)*



*MediaSciences
5pt text
(Source – BLI)*



*Xprint
5pt text
(Source – BLI)*

Photographs and media

In our opinion, overall, OKI Printing Solutions Original toner outperformed all competitor non-genuine brands tested on grey photo reproduction and delivered the best results in smooth halftones with little evidence of composite makeup.

Xprint in particular demonstrated the worst quality of the three non-genuine brands where magenta overtones were concerned.

Superior grey tone and halftone reproduction from OKI Printing Solutions (Source – BLI)



Strong evidence of magenta overtones from Xprint (Source – BLI)



Superior image quality and rendering from OKI Printing Solutions (Source – BLI)



Less contrast and evidence of magenta overtones from Xprint (Source – BLI)



Colour gamut

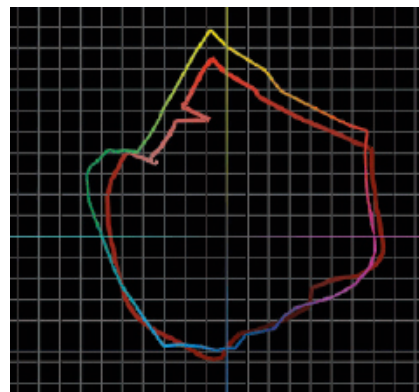
The term “colour gamut” refers to the range of colours that exist within a specified working space. For example, RGB has its own working space and range of colours; CMYK has a different working space and its own range of colours. Not all the colours that exist in the RGB working space exist in CMYK.

The most common usage of colour gamut refers to the subset of colours which can be accurately represented in a given circumstance. For example, within a given colour space or by a certain output device. The range of colours that can be achieved for CMYK printing relies on the interaction between digital processing, the media, the output device and the toner (or ink). In this scenario, the only variable was the toner.

BLI assessed the CIE (International Commission on Illumination) colour gamut volume at the start of the print run and after 10,000 impressions. Four separate tests were run using UPM Multitech 80gsm, UPM ImageTech 100gsm, Evolve Business 100% Recycled and UPM ImageTech 190gsm Media respectively.

The most significant variation was noted with Xprint. On the UPM 80gsm and 100gsm stock, OKI Printing Solutions colour gamut was 8.8% and 11.0% greater respectively than Xprint. In essence, this means that OKI Printing Solutions toner powders had more colour range at their disposal and were capable of reproducing printouts more accurately.

This reinforces OKI Printing Solutions recommendation that its OEM consumables are superior to third party supplies. This is because Original toner powder has been developed and formulated specifically for OKI Printing Solutions printer hardware and software utilisation, whereas manufacturers of compatible and remanufactured toner powders tend to use them across different models – and in some cases different brands of product.



Colour gamut chart at 10,000 impressions when printed on UPM ImageTech 100gsm colour laser paper showing OKI Printing Solutions [full colour outline] and Xprint [red outline] (Source – BLI)

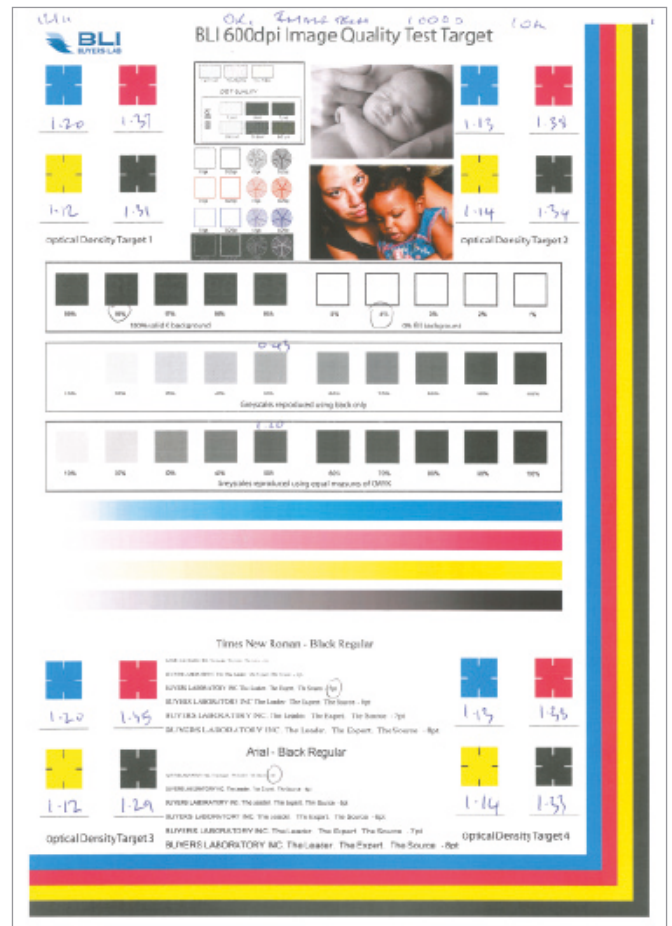
Solid fill image density variance

From report data supplied by BLI, we were able to calculate how OKI Printing Solutions performed in density variance. The results of our calculations are shown below.

At the mid point of the evaluation (10,000 pages) on UPM Multitech 80gsm, OKI Printing Solutions colour consistency was, on average, 50.0% better than that of MediaSciences and Xprint cartridges and 70.0% better than Katun's.

At 15,000 pages, OKI Printing Solutions was on a par with Katun's toner but on average was still showing colour consistency that was 37.0% better than MediaSciences and 16.0% better than Xprint.

At the next measurement stage of full life (20,000 pages) the cartridges from MediaSciences and Katun had failed to reach 20,000 pages and OKI Printing Solutions colour consistency was still better, on average, than that of Xprint.



Example of one of the test sheets used during the evaluation (Source – BLI)

Conclusion

These evaluations provide a vital source of information. Not only do they provide comparative data against our benchmarks but also serve as a valuable intelligence gathering process to increase our awareness of third party capabilities in the marketplace.

Supported by data supplied by BLI it is our opinion, of the third party consumables tested against our Original Consumables, there is no evidence that any can claim to be equal to or better than our original consumable products.

Furthermore, it should be noted that the non-genuine supplies in this particular evaluation are considered leaders in their field and there are many more non-genuine suppliers in the marketplace who fall far short of even these.

This supports our longstanding belief that there is no viable alternative to Original Consumables for all-round consistency, performance, reliability, print quality and, ultimately, value for money.



Only use genuine Oki Printing Solutions Original Consumables to ensure the best quality and performance from your hardware. Non Oki Printing Solutions Original products may damage your printer's performance and invalidate your warranty. Specifications subject to change without notice. All trademarks acknowledged.

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Consumables Evaluation Report: Q-Imaging Update

A comparative analysis of OKI Printing Solutions Original printer cartridges versus Q-Imaging compatible cartridges with excerpts from independent tests conducted by Buyers Laboratory Inc.



Introduction

In this document we present an update to our previous Evaluation Reports.

It was intended that Q-Imaging would feature in a previous report, but faulty product prevented that supplier from being part of the test. *(See section on Background Information that follows).*

The evaluation of the performance of Q-Imaging toner cartridges compared to OKI Printing Solutions Original cartridges was conducted by Buyers Laboratory Inc. (BLI) which also carried out the previous Evaluation Report.

We recommend that this update is read in conjunction with the main Evaluation Report. That document contains more detailed information about the methodology behind the testing. Furthermore, it provides the backdrop for the evaluation of the four selected non-genuine suppliers (one of which was Q-Imaging).

The text in this and the main Evaluation Report has been prepared by OKI Printing Solutions. Test data and various images have been supplied by BLI.

Background information

Cartridges from Q-Imaging were scheduled to be part of the previous Evaluation Report which also featured non-genuine supplies from MediaSciences, Katun and XPrint. However, during OKI's pre-test inspection, it was identified that the RFIDs were missing from all Q-Imaging cartridges.

The product was returned to Q-Imaging. RFIDs were inserted and the cartridges were resubmitted for testing. During a second attempt to run a set of Q-Imaging cartridges further problems were encountered. This time we found that the centre-post seating pin was misplaced, resulting in damage to and malfunction of the printer's image drums.

At that point the Q-Imaging product was withdrawn from the test and BLI was commissioned to source and evaluate Q-Imaging cartridges at a later date. The comparative testing of OKI Printing Solutions Original cartridges against the remanufactured cartridges of Q-Imaging has since taken place and the results are summarized in this document.

More information about the problems encountered with the Q-Imaging product in the earlier test can be found in the Evaluation Report previous to this one.

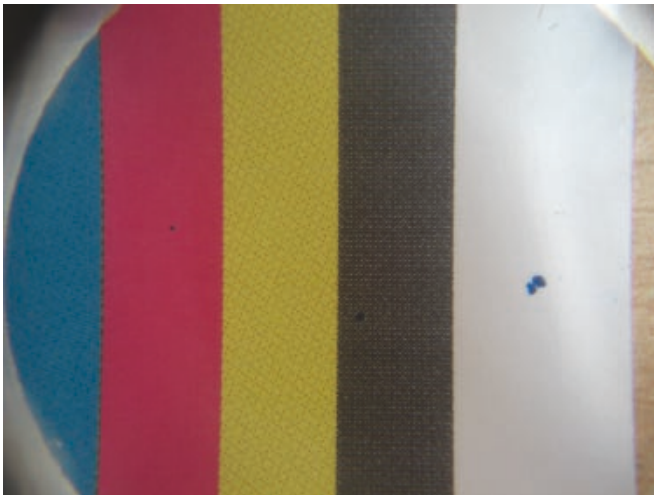
Key findings of external testing

BLI reported that Q-Imaging's remanufactured toner cartridges delivered a higher average toner yield than OKI's Original cartridges across the CMYK range. This was deemed to be as a result of Q-Imaging overfilling the cartridges. The cartridge weights were recorded during the test and it was noted that some Q-Imaging cartridges contained twice as much toner as the comparable Original cartridge.

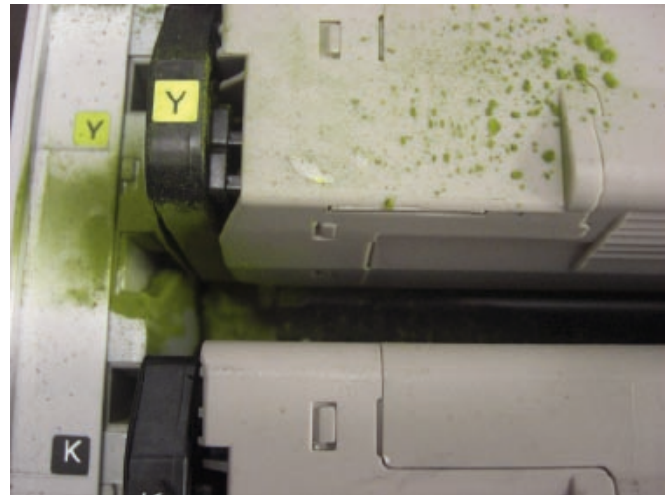
In reference to Q-Imaging, BLI stated ***“testing uncovered serious issues relating to product consistency, reliability, damage to printer components and overall image quality”***.

Overall, OKI Printing Solutions Original toner delivered superior image quality with text reproduction and halftone definition also showing a clear advantage in favour of OKI Printing Solutions.

In OKI's opinion – and supported by the details that follow – OKI Printing Solutions Original Consumables were adjudged to offer superior levels of reliability and consistency against the competitor cartridges on test.



*Q-Imaging Cyan toner leaking on to printouts at 20,413 impressions
(Source – BLI)*



*Q-Imaging Yellow imaging unit split due to toner leakage at 25,428 impressions
(Source – BLI)*

Overview of page yield results

Taking all of the 12 cartridges tested from OKI Printing Solutions against the 12 cartridges tested from Q-Imaging, the non-genuine supplier achieved a greater page yield overall.

However, we suggest that the above statement should not be taken at face value for the following reasons:

- Q-Imaging does not advertise an expected yield. Therefore the customer has no benchmark against which to judge what the page yield might be – apart from the supplier's claim that it is compatible with the C5900 printer
- All OKI Printing Solutions Original cartridges exceeded their stated yield. However, according to BLI, there was a much higher variance in the amount of toner (and consequent page yield) in the Q-Imaging cartridges. For example, two of the three Black Q-Imaging cartridges tested weighed (before testing) 480.70g and 488.50g respectively. The third Black cartridge weighed only 440.70g and delivered 2,035 pages lower than the average Black yield of the three OKI Printing Solutions Black toner cartridges.

A similar issue occurred with Q-Imaging Cyan toner cartridges with one of the three cartridges delivering a significantly lower yield than the other two while also a lower page yield than two of the OKI Printing Solutions Cyan toner cartridges

- OKI Printing Solutions toner cartridges have been designed to operate effectively and deliver appropriate page yields with specific maximum and minimum amounts of toner. We believe that introducing additional quantities of toner may give rise to toner flow and clumping problems as well as placing excessive stress on moving parts. This belief is borne out in the following section on Reliability

In OKI's opinion, any advantage Q-Imaging may wish to claim over OKI is totally undermined by inconsistent yields across the cartridges (i.e., powder content variance) and failings in other areas.

In our experience, overfilling increases the risk of toner leakage which, in turn, damages other components in the printer. This became evident during the evaluation with drum damage plus speckling and sporadic marks on print output.

Observations on reliability levels

Reliability was assessed throughout the testing and incidents of cartridge malfunctions, out-of-box failures, operation failures, toner leakage, drum flaws as well as printer malfunctions caused by cartridges were recorded.

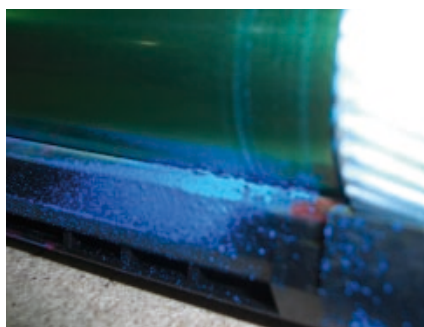
During testing, OKI Printing Solutions Original cartridges performed at 100% reliability. BLI observed no reliability issues, with all OKI toners running to exhaustion and no evidence of toner spill inside the devices.

In contrast, various problems with Q-Imaging printing were reported by BLI as the test progressed.

Record of issues with Q-Imaging toner

13,700 – Yellow marks appear sporadically down the centre of the page.

14,000 – Cyan toner speckling starts to appear on some printed output along the sides of sheets.



*Q-Imaging toner leakage at the Cyan imaging unit at 14,000 impressions
(Source – BLI)*

15,000 – The yellow marking is now on every page and is so pronounced that BLI determined that the end user would classify output as substandard.



*Yellow marking down centre of Q-Imaging printed output at 15,000 impressions
(Source – BLI)*

20,413 – Black toner spots start to appear down the side of the prints.

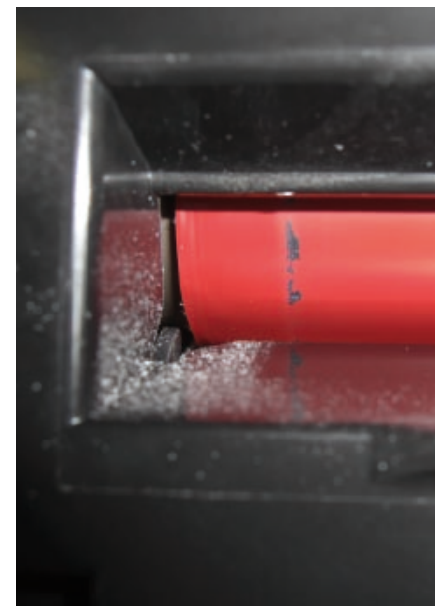


*Black toner leaking in image drum causing black spots in Q-Imaging printouts at 20,413 impressions
(Source – BLI)*

25,428 – The side casing of the Yellow drum unit burst open, spilling toner on to the transfer belt and also contaminating the Black imaging drum. The printer was vacuumed out and a new Yellow drum unit and Yellow toner cartridge were installed.

On completion of the test at **27,639** impressions, BLI inspected all core imaging components and observed that the fuser roller was also contaminated along the edge of the paper path.

While not yet showing up within the print samples during the test, BLI and OKI share the opinion that the problem would continue to escalate until contamination started to cause fusing issues, reducing the life expectancy of the fuser unit.



*Fuser roller wear and tear at 27,639 impressions
(Source – BLI)*

Halftone reproduction

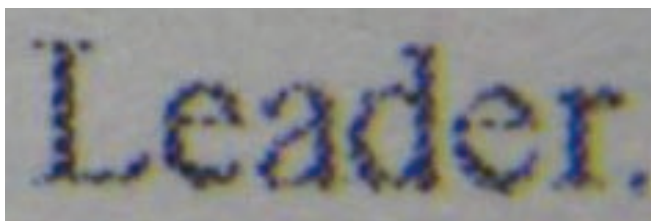
Halftone reproduction was measured by assessing the toner's ability to match a predetermined set of halftone values. These included 95% to 99% on a solid Black background and 1% to 5% on a pure white background.

BLI reported that OKI Printing Solutions Original toner delivered better reproduction throughout on dark contrasts and overall performed better on light contrasts. It should be noted that on six occasions during the tests, Q-Imaging toner was out of range and failed to match the predetermined values on the test pattern.

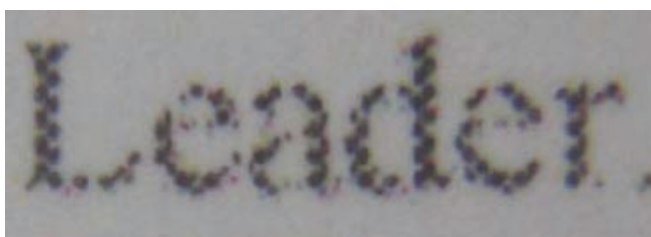
Text reproduction

BLI reported that text reproduction using OKI Printing Solutions Original toner showed a clear advantage overall against Q-Imaging – especially with serif fonts which exhibited cleaner character formation.

This was particularly evident when reproducing small fonts. The images below are enlarged photographs of a text extract printed at 5-point Times New Roman on 100gsm colour laser stock.



*OKI Printing Solutions
5pt text
(Source – BLI)*

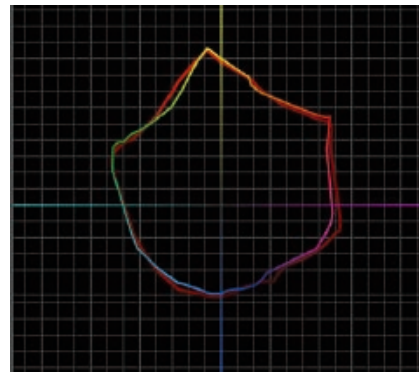


*Q-Imaging
5pt text
(Source – BLI)*

Colour gamut and Conclusion

BLI assessed the CIE (International Commission on Illumination) colour gamut volume at the start of the print run and after 10,000 impressions. Four separate tests were run using UPM Multitech 80gsm, UPM ImageTech 100gsm, Evolve Business 100% Recycled and UPM ImageTech 190gsm Media respectively.

BLI reported that the OKI Printing Solutions Original toner generated a larger colour gamut on all media types with the exception of the UPM 190gsm card stock at 10,000 pages.



Colour gamut chart at 10,000 impressions when printed on UPM ImageTech 100gsm colour laser paper showing OKI Printing Solutions [full colour outline] and Q-Imaging [red outline] (Source – BLI)

Conclusion

From the data and observations supplied to us by BLI on this evaluation – and based on the facts – we see no evidence to suggest that Q-Imaging remanufactured cartridges offer a practical, environmentally friendly or cost-effective alternative to OKI Printing Solutions Original Consumables.

From OKI's perspective, we would hope that the end-user would take heed about the significant variation in the amount of toner included from one Q-Imaging cartridge to another. This, coupled with the fact that Q-Imaging does not specify a page yield, is likely to generate some uncertainty over yield with customers who are buying, quite literally, an unknown quantity.

Furthermore, it should be noted that the non-genuine supplier in this update is considered by some to be a market leader. In our opinion – and borne out by the testing – the reliability issues and damage to printer components reported by BLI could cause unnecessary inconvenience, additional cost and loss of productivity to customers who believed they were buying a 'greener' or cheaper compatible.

This supports our long-standing belief that there is no viable alternative to Original Consumables for all-round consistency, performance, reliability, print quality and, ultimately, value for money.

This document has been prepared by OKI Printing Solutions using excerpts and data from comparative evaluation reports commissioned from BLI. All data and excerpts directly from the BLI reports are clearly identified. All other comments made within the document are OKI's conclusions and interpretations of said data.

Only use genuine OKI Printing Solutions Original Consumables to ensure the best quality and performance from your hardware. Non OKI Printing Solutions Original products may damage your printer's performance and invalidate your warranty. Specifications subject to change without notice. All trademarks acknowledged.

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