



**Cost of Ink Per Page Analysis
United States
High Yield Cartridges**

December 23, 2008

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Summary and Scope of Analysis

For more than 22 years, QualityLogic Inc. has been a premier developer and provider of essential testing solutions to companies that design, build, or purchase printers and printing technology. Our products and services help our customers understand how the products they make or buy conform to specifications, or compare to reference implementations or competing products. We are active members of international standards organizations including ISO and Ecma International, and provide testing assistance to leading technology publications who publish printer reviews.

At the request of Eastman Kodak Company, QualityLogic calculated and compared the Cost of Ink Per Page (CoIPP) of the ESP-3 and ESP-5 All-in-One Printers to 5 competing printers selected by Kodak. Kodak's intent was to select printers with significant market share from leading manufacturers.

Monochrome and color cartridge yields for all printers were determined following ISO yield standards, and photo yields were determined using QualityLogic's photo yield methodology*.

Cartridge prices used in this Cost of Ink Per Page analysis were researched and provided to QualityLogic by Kodak as of December 2008. For this report, standard as-shipped-in-box cartridges for Kodak were used while all other printers used High Yield cartridges. Cartridge pricing was based on single quantity pricing (i.e no multi-packs, combo packs, value packs or special promotions).

Although there are many factors in total cost of ownership, Cost of Ink Per Page (CoIPP) is an important factor when evaluating total cost of ownership with printer systems.

Cost of Ink Per Page was calculated by dividing these cartridge prices by the yield of each cartridge in the test.

* All references of 'photo' in this report refer to 4x6 inch (approximately 10 x 15 cm) borderless photos.

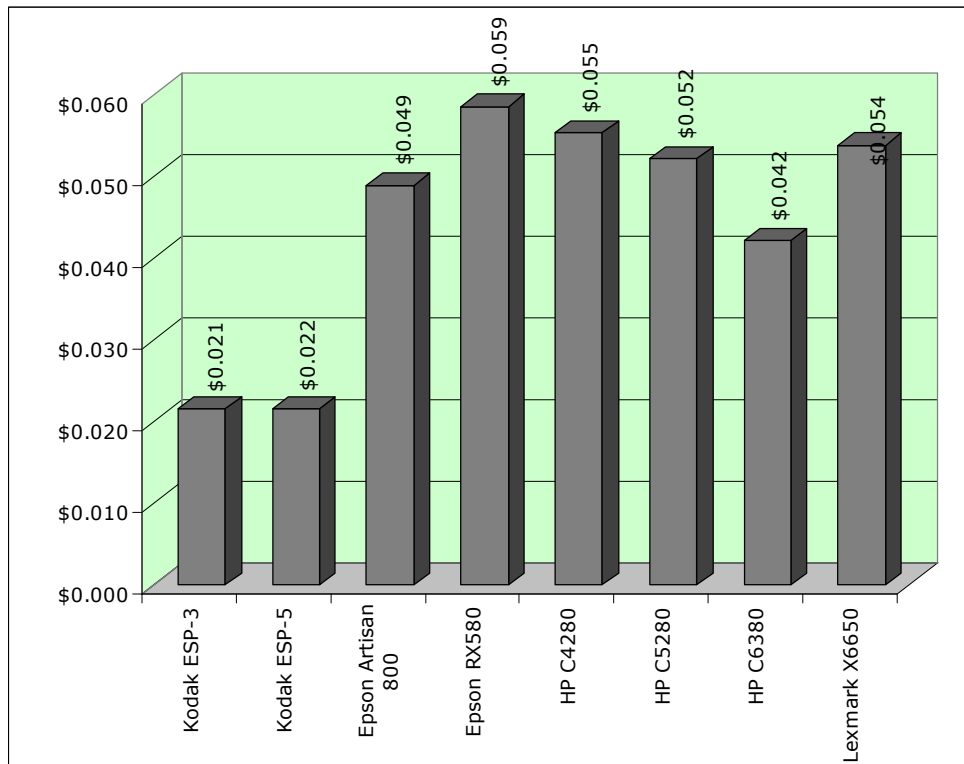
The following printers and corresponding ink cartridges were included in this Cost of Ink Per Page analysis:

Company	Printer	Cartridges
Kodak	ESP-3 ESP-5	Black Ink Cartridge 10, Color Ink Cartridge 10 Black Ink Cartridge 10, Color Ink Cartridge 10
Epson	Artisan 800 RX580	T0981, T0982, T0983, T0984, T0985, T0986 T0771, T0772, T0773, T0774, T0775, T0776
Hewlett-Packard	Photosmart C4280 Photosmart C5280 Photosmart C6380	HP74XL, HP75XL HP74XL, HP75XL HP 564XL - CB316WN, CB317WN, CB318WN, CB319WN, CB320WN
Lexmark	X6650	36XLA, 37XLA

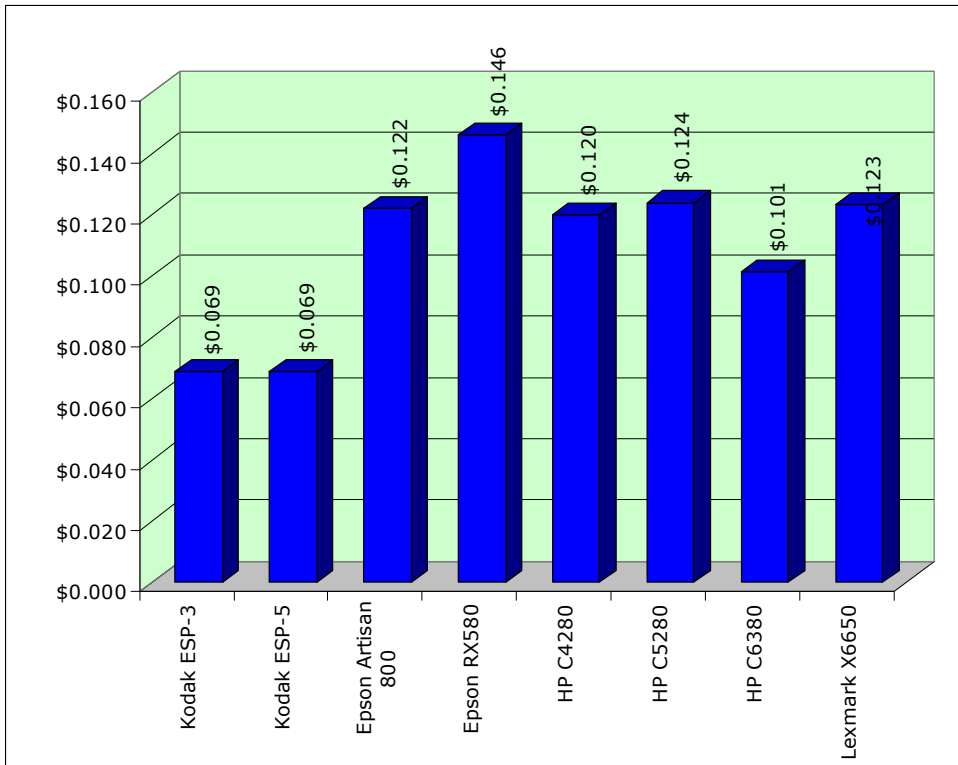
Cost of Ink Per Page

The following charts summarize the Cost of Ink Per Page for the printers tested using cartridge prices from The United States. There are three charts presented: separate charts for monochrome, color and photo printing. Details of how these costs were calculated can be found in the "Methodology for Calculation of Cost of Ink Per Page" following these graphs.

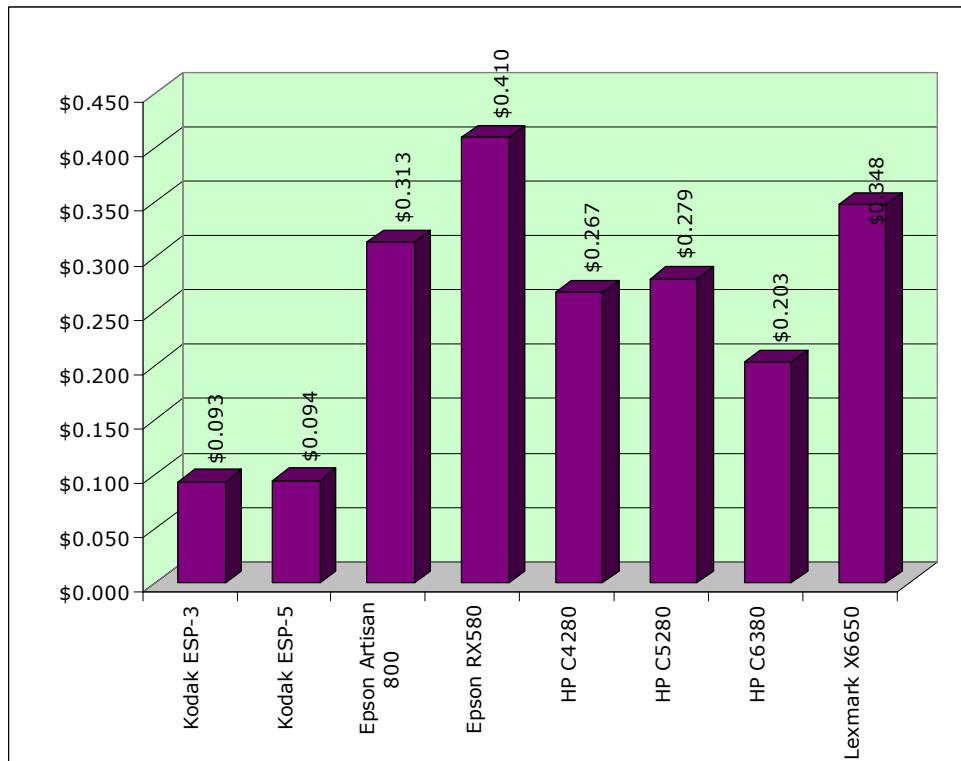
United States: Mono - Cost of Ink Per Page



United States: Color - Cost of Ink Per Page



United States: Photo - Cost of Ink Per Page



Methodology for Calculation of Cost of Ink Per Page

The following is a step-by-step outline of how QualityLogic, using standardized yield testing methodologies and standard pricing information provided by Kodak, executed this 'Cost of Ink Per Page' test for Kodak.

A. QualityLogic Yield Declarations

Yield testing is a process by which the target printers are operated with their ink or toner cartridges to exhaust the amount of ink/toner, and then pages printed are counted to determine the number of pages each cartridge yields. The requirements and operating conditions of such testing are determined by a standard set of testing criteria that will provide an objective and repeatable result.

QualityLogic is a leader worldwide in providing yield testing services. We support and follow the ISO (International Standards Organization) standards for mono and color testing. Use of the ISO standards for yield testing is also supported by leading manufacturers, including Canon, Dell, Epson, HP, IBM, Kodak, Lexmark, Oki Data, Pitney Bowes, Ricoh, Toshiba, Xerox, and others.

ISO is currently working on a standard for photo ink. Until this standard is released, QualityLogic uses a methodology we developed that closely follows the current ISO standards approach.

Key provisions of these standards include:

- Standard test suites
- Minimum of nine cartridges across three printers representative of products in open market
- Clear, objective end-of-life criteria
- Controlled test environment – temperature, continuous printing
- Yield reporting requirement well defined

The following pages contain tables that relate to yield testing results. The tables show the number of pages per cartridge that can be expected with 90 percent confidence based on our testing. Numbers in black indicate primary cartridges – any cartridge where a minimum of nine cartridges across three printers could be exhausted. Supplemental cartridges are indicated by red numbers and represent those cartridges that are secondary to the purpose of the test. Although supplemental cartridges are not the key focus in the tests as shown, they are included in the test reports to ensure we get a complete understanding of the ink being used.

Generally, the 'primary' cartridges for each category of testing are:

- Mono ink – the black cartridge
- Color ink – all full density cartridges containing cyan, magenta, or yellow
- Photo ink – color cartridges or others where nine cartridges were exhausted

QualityLogic performed yield tests and provided yield test reports for all cartridges for models listed below (with some of the same models also available in Europe and in North America). Each table has abbreviated sub-headings that represent the specific ink cartridge types as follows:

CMY = A single cartridge containing cyan, magenta and yellow *
 C = Cyan
 M = Magenta
 Y = Yellow
 K1 = Black
 K2 = A second black cartridge
 LC = Light cyan
 LM = Light magenta

These yield numbers apply to printers included in this analysis. Yields of primary and supplemental cartridges are reported, and the details of these results can be found in Appendix C.

	Mono Ink yield							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	4313				555			
Kodak ESP-5	4395				551			
Epson Artisan 800		3232	3239	10597	608		3103	3816
Epson RX580		4924	6192	5150	547		3734	3660
HP C4280	3390				725			
HP C5280	3216				793			
HP C6380		7006	8692	8441	827	10405		
Lexmark X6650	105425				580			

Note: Kodak's color cartridge includes black and protective inks.

	Color Ink yield							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	379				340			
Kodak ESP-5	379				342			
Epson Artisan 800		1547	725	1085	577		530	1060
Epson RX580		1741	795	797	523		730	1076
HP C4280	516				691			
HP C5280	491				689			
HP C6380		781	813	680	777	3390		
Lexmark X6650	550				571			

Note: Kodak's color cartridge includes black and protective inks.

	Photo Ink yield							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	173				1509			
Kodak ESP-5	172				1371			
Epson Artisan 800		754	557	375	589		158	177
Epson RX580		657	427	302	552		161	189
HP C4280	145				6014			
HP C5280	139				5190			
HP C6380		261	456	309	5532	255		
Lexmark X6650	110				12740			

Note: Kodak's color cartridge includes black and protective inks.

B. Ink Cartridge Pricing

Cartridge prices used in this Cost of Ink Per Page analysis were researched and provided to QualityLogic by Kodak as of December 2008. For this report, standard as-shipped-in-box cartridges for Kodak were used while all other printers used High Yield cartridges. Cartridge pricing was based on single quantity pricing (i.e no multi-packs, combo packs, value packs or special promotions). Below is the summary of the ink cartridges and their individual prices.

	Ink Cartridge Pricing							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	\$14.99				\$9.99			
Kodak ESP-5	\$14.99				\$9.99			
Epson Artisan 800		\$15.99	\$15.99	\$15.99	\$17.09		\$15.99	\$15.99
Epson RX580		\$19.99	\$19.99	\$19.99	\$19.99		\$19.99	\$19.99
HP C4280	\$37.99				\$31.99			
HP C5280	\$37.99				\$31.99			
HP C6380		\$14.99	\$14.99	\$14.99	\$28.99	\$14.99		
Lexmark X6650	\$37.99				\$30.99			

Source: Kodak

C. Cost of Ink Per Page – Per Cartridge

QualityLogic then calculated the Cost of Ink Per Page per cartridge by dividing the price of each cartridge (as defined by Kodak's cartridge price, noted above in Section B) by the yield for each cartridge in each model (as defined above in Section A). This calculation results in the Cost of Ink Per Page per cartridge for each test mode: mono, color and photo.

$$\frac{\text{Price per cartridge}}{\text{Ink yield (in number of pages/photos)}} = \text{Cost of Ink Per Page – per cartridge}$$

Mono Cost of Ink Per Individual Cartridge per Page

	Mono Ink Cost							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	\$0.003				\$0.018			
Kodak ESP-5	\$0.003				\$0.018			
Epson Artisan 800		\$0.005	\$0.005	\$0.002	\$0.028		\$0.005	\$0.004
Epson RX580		\$0.004	\$0.003	\$0.004	\$0.037		\$0.005	\$0.005
HP C4280	\$0.011				\$0.044			
HP C5280	\$0.012				\$0.040			
HP C6380		\$0.002	\$0.002	\$0.002	\$0.035	\$0.001		
Lexmark X6650	\$0.000				\$0.053			

Color Cost of Ink Per Individual Cartridge per Page

	Color Ink cost							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	\$0.040				\$0.029			
Kodak ESP-5	\$0.040				\$0.029			
Epson Artisan 800		\$0.010	\$0.022	\$0.015	\$0.030		\$0.030	\$0.015
Epson RX580		\$0.011	\$0.025	\$0.025	\$0.038		\$0.027	\$0.019
HP C4280	\$0.074				\$0.046			
HP C5280	\$0.077				\$0.046			
HP C6380		\$0.019	\$0.018	\$0.022	\$0.037	\$0.004		
Lexmark X6650	\$0.069				\$0.054			

Photo Cost of Ink Per Individual Cartridge per Page

	Photo Ink Cost							
	CMY	C	M	Y	K1	K2	LC	LM
Kodak ESP-3	\$0.087				\$0.007			
Kodak ESP-5	\$0.087				\$0.007			
Epson Artisan 800		\$0.021	\$0.029	\$0.043	\$0.029		\$0.101	\$0.090
Epson RX580		\$0.030	\$0.047	\$0.066	\$0.036		\$0.124	\$0.106
HP C4280	\$0.262				\$0.005			
HP C5280	\$0.273				\$0.006			
HP C6380		\$0.057	\$0.033	\$0.049	\$0.005	\$0.059		
Lexmark X6650	\$0.345				\$0.002			

D. Cost of Ink Per Page

Cost of Ink Per Page for each printer is calculated by summing the Cost of Ink Per Page per cartridge for each cartridge tested in a given printer model (as determined above in Section C).

$$\text{Cost of Ink Per Page} = \text{CMY} + \text{C} + \text{M} + \text{Y} + \text{K1} + \text{K2} + \text{LC} + \text{LM}$$

The Cost of Ink Per Page per printer is reflected below. Note that, due to rounding, the total CoIPP may not match the individual ink cartridge costs.

Mono Cost of Ink Per Individual Cartridge and Total Cost of Ink Per Page

	Mono Ink Cost								Mono CoIPP
	CMY	C	M	Y	K1	K2	LC	LM	
Kodak ESP-3	\$0.003				\$0.018				\$0.021
Kodak ESP-5	\$0.003				\$0.018				\$0.022
Epson Artisan 800		\$0.005	\$0.005	\$0.002	\$0.028		\$0.005	\$0.004	\$0.049
Epson RX580		\$0.004	\$0.003	\$0.004	\$0.037		\$0.005	\$0.005	\$0.059
HP C4280	\$0.011				\$0.044				\$0.055
HP C5280	\$0.012				\$0.040				\$0.052
HP C6380		\$0.002	\$0.002	\$0.002	\$0.035	\$0.001			\$0.042
Lexmark X6650	\$0.000				\$0.053				\$0.054

Color Cost of Ink Per Individual Cartridge and Total Cost of Ink Per Page

	Color Ink cost								Color CoIPP
	CMY	C	M	Y	K1	K2	LC	LM	
Kodak ESP-3	\$0.040				\$0.029				\$0.069
Kodak ESP-5	\$0.040				\$0.029				\$0.069
Epson Artisan 800		\$0.010	\$0.022	\$0.015	\$0.030		\$0.030	\$0.015	\$0.122
Epson RX580		\$0.011	\$0.025	\$0.025	\$0.038		\$0.027	\$0.019	\$0.146
HP C4280	\$0.074				\$0.046				\$0.120
HP C5280	\$0.077				\$0.046				\$0.124
HP C6380		\$0.019	\$0.018	\$0.022	\$0.037	\$0.004			\$0.101
Lexmark X6650	\$0.069				\$0.054				\$0.123

Photo Cost of Ink Per Individual Cartridge and Total Cost of Ink Per Page

	Photo Ink Cost								Photo CoIPP
	CMY	C	M	Y	K1	K2	LC	LM	
Kodak ESP-3	\$0.087				\$0.007				\$0.093
Kodak ESP-5	\$0.087				\$0.007				\$0.094
Epson Artisan 800		\$0.021	\$0.029	\$0.043	\$0.029		\$0.101	\$0.090	\$0.313
Epson RX580		\$0.030	\$0.047	\$0.066	\$0.036		\$0.124	\$0.106	\$0.410
HP C4280	\$0.262				\$0.005				\$0.267
HP C5280	\$0.273				\$0.006				\$0.279
HP C6380		\$0.057	\$0.033	\$0.049	\$0.005	\$0.059			\$0.203
Lexmark X6650	\$0.345				\$0.002				\$0.348

Contact Information

For information regarding this Cost of Ink Per Page Analysis, please contact the following person/s:

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Appendix A: QualityLogic Declared Yield Test Results

The following data was extracted from the Yield Reports for each product tested. Complete reports are available from QualityLogic upon request.

ISO Test Results - Summary

Test Methodology

In order to obtain these yield results, two different methodologies were used in combination with three test suites. This section will detail the common areas between the methodologies, the differences between them, and highlight some key terms from ISO/IEC 24711, 24712, and 19752 that are particularly important to understand when reviewing these yield claims.

Common Methodology and Definitions

Number of Printers Tested	Minimum of three
Number of Cartridges Tested	Minimum of nine of each color
Temperature	Testing room average 23.0°C ± 2°C with all running average temperatures between 20.0°C and 26.0°C
Humidity	Testing room average 50% ± 10% RH with all running average RH readings between 35% and 65%
Fade	Phenomenon in which a significant reduction in uniformity occurs due to ink depletion
Ink Out	Signal generated by the printing system when the usable ink in the system is depleted and the printer stops printing
End of Life (EOL)	A condition determined by one of two mechanisms: fade or ink out (only if ink out stops printing)
Semi-Continuous Printing	Printing in a continuous manner, pausing only for intra-job servicing, printer calibrations, paper changes, breaks, and end of work days
Declared Cartridge Yield	Cartridge Yield (in pages) that is at or below the lower 90% confidence bound of the average yield
Estimated Supplemental Cartridge Yield	Estimated yield for a supplemental cartridge (real or estimated with use of a proxy) calculated with at least three cartridges
Average Supplemental Cartridge Yield	Average yield for a supplemental cartridge where EOL was reached on at least nine cartridges (three per printer)
Proxy Cartridge	A primary cartridge of the same physical size as a supplemental cartridge which had a starting weight within +/- 10% of the supplemental cartridge starting weight.

**Mono Ink Methodology and Definitions –
In accordance with ISO/IEC 24711, ISO/IEC 19752**

Test Suite	ISO/IEC 19752
Driver Set-up*	See Color Ink Methodology. In addition, if a "Black Only" or "Text Only" mode was available in the driver, it was enabled.
Paper	A4 or 8 ½" x 11" (see individual test reports)
Semi-Continuous Printing	Each copy of the test suite was printed as a separate one-page print job allowing for some intra-job servicing and calibration to take place
Primary Cartridge	The black cartridge or, if no black cartridge was present, the color cartridges that were used to develop composite black.
Supplemental Cartridge	Any installed cartridge except the full density black cartridge, including the full density Cyan, Magenta, and Yellow cartridges, as well as any photo cartridges
Individual Cartridge Yield	The number of test pages printed between cartridge installation and end of life

**Color Ink Methodology and Definitions –
In accordance with ISO/IEC 24711, ISO IEC 24712**

Test Suite	ISO/IEC 24712
Driver Set-up*	All image and print quality modifiers were set to their factory pre-set configuration for the printer and default installed condition for the driver. If auto media detection was available on the printer, it was disabled and media-type set to plain paper.
Paper	A4 or 8 ½" by 11" (see individual test reports)
Semi-Continuous Printing	Each copy of the test suite was printed as a separate five-page print job allowing for some intra-job servicing and calibration to take place
Primary Cartridge	Cartridge containing full density black, cyan, magenta, or yellow, or a combination of full density cyan, magenta and yellow.
Supplemental Cartridge	Cartridge other than the full density cyan, magenta, yellow and black cartridges
Individual Cartridge Yield	Value determined by counting the number of diagnostic pages (last page of the test page suite) printed between cartridge installation and end of life, and multiplying by five

**Photo Ink Methodology and Definitions –
In accordance with QualityLogic Color Photo Cartridge Yield Test
Methodology**

Test Suite	QualityLogic Color Photo Suite
Driver Set-up*	The highest print quality mode readily available in the driver was used
Paper	The best photo paper recommended by each manufacturer. A4 or 8 ½" x 11" papers were used to print a borderless 4" x 6" (approximately 10 x 15 cm) photo. (See individual test reports)
Semi-Continuous Printing	Each copy of the test suite was printed as a separate 10-page print job allowing for some intra-job servicing and calibration to take place
Primary Cartridge	Cyan, Magenta, Yellow and Photo cartridges or any cartridges containing these colors were considered as primary cartridges. In addition, any other cartridge that exhausted nine or more cartridges during the execution of nine of the above cartridges was considered as primary.
Supplemental Cartridge	Any cartridge installed in the printer while printing photos that did not meet the definition of a primary cartridge was considered a supplemental cartridge
Individual Cartridge Yield	The number of test pages printed between cartridge installation and end of life

The following data was extracted from the Yield Reports for each product tested – complete reports are available upon request.

Printer Identifier	ESP-3 All-in-One Printer
Printer Manufacturer	Kodak
Cartridge Identifier	Black Ink Cartridge 10 & Color Ink Cartridge 10
Cartridge Type	Separate ink supply and print head
Date Tested	September 10, 2008 to September 22, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness, 20lb. weight
Driver version	Driver Version=07/17/2008, 2.07.0151.0 Color Ink test: The driver's default settings were used. Mono Ink Test: Print color as = Changed to Black and White from Color

Declaration of Yield

Inkjet Cartridge Yield when tested in Kodak ESP-3 All-in-One Printer:

Using the test suite defined in ISO/IEC 24712 provides the following results:

Average K (Black) Cartridge Yield – Up to 340 standard pages

Average Color Cartridge Yield – Up to 379 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

Average K (Black) Cartridge Yield – Up to 555 standard pages

Estimated supplemental Color Cartridge Yield – Up to 4,313 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
Black Ink Cartridge 10	K (Black)	345	340	9/12
Color Ink Cartridge 10	Color	386	379	9/9

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
Black Ink Cartridge 10	K (Black)	557	555	24/24
Color Ink Cartridge 10*	Color	4,758	4,313	3/3

* Denotes supplemental cartridge

Printer Identifier	ESP-3 All-in-One Printer
Printer Manufacturer	Kodak
Cartridge Identifier	Black Ink Cartridge 10 & Color Ink Cartridge 10
Cartridge Type	Separate ink supply and print head
Date Tested	September 10, 2008 to September 22, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo paper
Media used	KODAK Ultra Premium Photo Paper High Gloss
Driver version	Driver Version=07/17/2008, 2.07.0151.0 The driver's default settings were used.

Declaration of Yield

Inkjet Cartridge Yield when tested in Kodak ESP-3 All-in-One Printer:

Using the QualityLogic Color Photo test suite provides the following results:

Average Color Cartridge Yield – Up to 173 standard pages

Estimated supplemental K (Black) Cartridge Yield – Up to 1,509 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
Color Ink Cartridge 10	Color	173	173	9/9
Black Ink Cartridge 10*	K (Black)	1,719	1,509	3/3

* Denotes supplemental cartridge

Printer Identifier	ESP-5 All-in-One Printer
Printer Manufacturer	Kodak
Cartridge Identifier	Black Ink Cartridge 10 & Color Ink Cartridge 10
Cartridge Type	Separate ink supply and print head
Date Tested	August 25, 2008 to September 4, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness, 20lb. weight
Driver version	Driver Version=07/17/2008, 2.07.0151.0 Color Ink test: The driver's default settings were used. Mono Ink Test: Print color as = Changed to Black and White from Color

Declaration of Yield

Inkjet Cartridge Yield when tested in Kodak ESP-5 All-in-One Printer:

Using the test suite defined in ISO/IEC 24712 provides the following results:

Average K (Black) Cartridge Yield – Up to 342 standard pages

Average Color Cartridge Yield – Up to 379 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

Average K (Black) Cartridge Yield – Up to 551 standard pages

Estimated supplemental Color Cartridge Yield – Up to 4,395 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
Black Ink Cartridge 10	K (Black)	347	342	9/12
Color Ink Cartridge 10	Color	387	379	9/9

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
Black Ink Cartridge 10	K (Black)	552	551	24/24
Color Ink Cartridge 10*	Color	4,415	4,395	3/3

* Denotes supplemental cartridge

Printer Identifier	ESP-5 All-in-One Printer
Printer Manufacturer	Kodak
Cartridge Identifier	Black Ink Cartridge 10 & Color Ink Cartridge 10
Cartridge Type	Separate ink supply and print head
Date Tested	September 4, 2008 to September 8, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo paper
Media used	KODAK Ultra Premium Photo Paper High Gloss
Driver version	Driver Version=07/17/2008, 2.07.0151.0 The driver's default settings were used.

Declaration of Yield

Inkjet Cartridge Yield when tested in Kodak ESP-5 All-in-One Printer:

Using the QualityLogic Color Photo test suite provides the following results:

Average Color Cartridge Yield – Up to 172 standard pages

Estimated supplemental K (Black) Cartridge Yield – Up to 1,371 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
Color Ink Cartridge 10	Color	173	172	9/9
Black Ink Cartridge 10*	K (Black)	1,677	1,371	3/3

* Denotes supplemental cartridge

Printer Identifier	Epson Artisan 800
Printer Manufacturer	Epson
Cartridge Identifier	T0981, T0982, T0983, T0984, T0985, T0986
Cartridge Type	Separate ink supply and print head
Date Tested	October 10, 2008 to October 17, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	Driver Version= Epson Color Printing System 6.62

Declaration of Yield

Inkjet Cartridge Yield when tested in Epson Artisan 800:

Using the test suite defined in ISO/IEC 24712 provides the following results:

- Average K (Black) Cartridge Yield – Up to 577 standard pages
- Average Cyan Cartridge Yield – Up to 1,547 standard pages
- Average Yellow Cartridge Yield – Up to 1,085 standard pages
- Average Magenta Cartridge Yield – Up to 725 standard pages
- Average supplemental Light Cyan Cartridge Yield – Up to 530 standard pages
- Average supplemental Light Magenta Cartridge Yield – Up to 1,060 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

- Average K (Black) Cartridge Yield – Up to 608 standard pages
- Estimated supplemental Cyan Cartridge Yield – Up to 3,232 standard pages
- Estimated supplemental Yellow Cartridge Yield – Up to 10,597 standard pages
- Estimated supplemental Magenta Cartridge Yield – Up to 3,239 standard pages
- Estimated supplemental Light Cyan Cartridge Yield – Up to 3,103 standard pages
- Estimated supplemental Light Magenta Cartridge Yield – Up to 3,816 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
T0981	K (Black)	582	577	23/26
T0982	Cyan	1,569	1,547	9/9
T0984	Yellow	1,096	1,085	12/15
T0983	Magenta	735	725	18/21
T0985*	Light Cyan	534	530	25/28
T0986*	Light Magenta	1,073	1,060	12/15

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
T0981	K (Black)	613	608	9/9
T0982*	Cyan	3,405	3,232	3/3
T0984*	Yellow	12,623	10,597	3/3
T0983*	Magenta	3,528	3,239	3/3
T0985*	Light Cyan	3,160	3,103	3/3
T0986*	Light Magenta	4,047	3,816	3/3

* Denotes supplemental cartridge

Printer Identifier	Epson Artisan 800
Printer Manufacturer	Epson
Cartridge Identifier	T0981, T0982, T0983, T0984, T0985, T0986
Cartridge Type	Separate ink supply and print head
Date Tested	October 20, 2008 to October 29, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo paper
Media used	Epson Ultra Premium Photo Paper, Glossy (S042175)
Driver version	Driver Version= Epson Color Printing System 6.62 The following driver settings were changed from default: Paper and Quality Options = Changed to Ultra Premium Photo Paper Glossy from Plain Paper / Bright White Paper Changed to Photo RPM (Max dpi) from Normal

Declaration of Yield

Inkjet Cartridge Yield when tested in Epson Artisan 800:

Using the QualityLogic Color Photo test suite provides the following results:

- Average Cyan Cartridge Yield – Up to 754 standard pages
- Average Magenta Cartridge Yield – Up to 557 standard pages
- Average Yellow Cartridge Yield – Up to 375 standard pages
- Average Light Cyan Cartridge Yield – Up to 158 standard pages
- Average Light Magenta Cartridge Yield – Up to 177 standard pages
- Average K (Black) Cartridge Yield – Up to 589 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
T0982	Cyan	765	754	9/9
T0984	Yellow	379	375	17/20
T0983	Magenta	564	557	12/15
T0985	Light Cyan	159	158	42/45
T0986	Light Magenta	177	177	38/41
T0981	K (Black)	594	589	9/12

* Denotes supplemental cartridge

Printer Identifier	Epson RX580 Photo All-in-One
Printer Manufacturer	Epson
Cartridge Identifier	T0771, T0772, T0773, T0774, T0775, T0776
Cartridge Type	Separate ink supply and print head
Date Tested	August 6, 2007 to August 22, 2007
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	DriverVer=06/08/2006, 6.00.00.00

Declaration of Yield

Inkjet Cartridge Yield when tested in Epson RX580 Photo All-in-One:

Using the test suite defined in ISO/IEC 24712 provides the following results:

- Average K (Black) Cartridge Yield – Up to 523 standard pages
- Average Cyan Cartridge Yield – Up to 1,741 standard pages
- Average Yellow Cartridge Yield – Up to 797 standard pages
- Average Magenta Cartridge Yield – Up to 795 standard pages
- Average supplemental Light Cyan Cartridge Yield – Up to 730 standard pages
- Average supplemental Light Magenta Cartridge Yield – Up to 1,076 standard pages.

Using the test page defined in ISO/IEC 19752 provides the following results:

- Average K (Black) Cartridge Yield – Up to 547 standard pages
- Estimated supplemental Cyan Cartridge Yield – Up to 4,924 standard pages
- Estimated supplemental Yellow Cartridge Yield – Up to 5,150 standard pages
- Estimated supplemental Magenta Cartridge Yield – Up to 6,192 standard pages
- Estimated supplemental Light Cyan Cartridge Yield – Up to 3,734 standard pages
- Estimated supplemental Light Magenta Cartridge Yield – Up to 3,660 standard pages.

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
T077120	K (Black)	531	523	30/36
T077220	Cyan	1,822	1,741	9/12
T077420	Yellow	814	797	18/24
T077320	Magenta	813	795	18/24
T077520*	Light Cyan	744	730	21/27
T077620*	Light Magenta	1,105	1,076	14/20

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
T077120	K (Black)	559	547	9/9
T077220*	Cyan	5,619	4,924	3/3
T077420*	Yellow	5,935	5,150	3/3
T077320*	Magenta	7,407	6,192	3/3
T077520*	Light Cyan	4,260	3,734	3/3
T077620*	Light Magenta	4,218	3,660	3/3

* Denotes supplemental cartridge

Printer Identifier	Epson RX580 Photo All-in-One
Printer Manufacturer	Epson
Cartridge Identifier	T0771, T0772, T0773, T0774, T0775, T0776
Cartridge Type	Separate ink supply and print head
Date Tested	August 23, 2007 to September 11, 2007
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo paper
Media used	Epson Ultra Premium Photo Paper, Glossy (S042175)
Driver version	DriverVer=06/08/2006, 6.00.00.00 The following settings were used: Quality Option = Best Photo Paper Type = Premium Photo Paper Glossy Paper size = 8x10

Declaration of Yield

Inkjet Cartridge Yield when tested in Epson RX580 Photo All-in-One:

Using the QualityLogic Color Photo test suite provides the following results:

- Average K (Black) Cartridge Yield – Up to 552 standard pages
- Average Cyan Cartridge Yield – Up to 657 standard pages
- Average Yellow Cartridge Yield – Up to 302 standard pages
- Average Magenta Cartridge Yield – Up to 427 standard pages
- Average Light Cyan Cartridge Yield – Up to 161 standard pages
- Average Light Magenta Cartridge Yield – Up to 189 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
T077120	K (Black)	568	552	9/12
T077220	Cyan	675	657	9/9
T077420	Yellow	310	302	18/21
T077320	Magenta	438	427	12/15
T077520	Light Cyan	166	161	36/38
T077620	Light Magenta	195	189	30/33

Printer Identifier	HP Photosmart C4280
Printer Manufacturer	Hewlett-Packard
Cartridge Identifier	HP74XL, HP75XL
Cartridge Type	Integral ink supply and print head
Date Tested	May 30, 2007 to June 12, 2007
EOL Criteria	Fade
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	Driver Version = 12/26/2006,61.063.247.00 The driver's default setting was used: Quality = Normal Paper = Plain

Declaration of Yield

Inkjet Cartridge Yield when tested in Hewlett-Packard Photosmart C4280 All-in-One:

Using the test suite defined in ISO/IEC 24712 provides the following results:

Average K (Black) Cartridge Yield – Up to 691 standard pages

Average Tri-color Cartridge Yield – Up to 516 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

Average K (Black) Cartridge Yield – Up to 725 standard pages

Estimated supplemental Tri-color Cartridge Yield Up to 3,390 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP74XL	K (Black)	702	691	9/12
HP75XL	Tri-color	532	516	9/15

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP74XL	K (Black)	763	725	9/9
HP75XL *	Tri-color	3,511	3,390	3/3

* Denotes supplemental cartridge

Printer Identifier	HP Photosmart C4280
Printer Manufacturer	Hewlett-Packard
Cartridge Identifier	HP74XL, HP75XL
Cartridge Type	Integral ink supply and print head
Date Tested	June 12, 2007 to June 14, 2007
EOL Criteria	Fade
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo paper
Media used	HP Premium Plus High-gloss Photo Paper (Q1785A)
Driver version	Driver Version = 12/26/2006,61.063.247.00 The following settings were used: Photo printing-with white borders Print Quality = Best Paper Type = HP Premium Plus Photo Paper

Declaration of Yield

Inkjet Cartridge Yield when tested in Hewlett-Packard Photosmart C4280 All-in-One:

Using the QualityLogic Color Photo test suite provides the following results:

Average Tri-color Cartridge Yield – Up to 145 standard pages

Estimated supplemental K (Black) Cartridge Yield – Up to 6,014 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP75XL	Tri-color	148	145	9/9
HP74XL *	K (Black)	6,407	6,014	3/3

* Denotes supplemental cartridge

Printer Identifier	HP Photosmart C5280
Printer Manufacturer	Hewlett-Packard
Cartridge Identifier	HP74XL, HP75XL
Cartridge Type	Integral ink supply and print head
Date Tested	July 6, 2007 to July 20, 2007
EOL Criteria	Fade
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	Driver Version = 3/15/2007,61.071.244.00 The driver's default setting was used: Quality = Normal Paper = Plain

Declaration of Yield

Inkjet Cartridge Yield when tested in Hewlett-Packard Photosmart C5280 All-in-One:

Using the test suite defined in ISO/IEC 24712 provides the following results:

Average K (Black) Cartridge Yield – Up to 689 standard pages

Average Tri-color Cartridge Yield – Up to 491 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

Average K (Black) Cartridge Yield – Up to 793 standard pages

Estimated supplemental Tri-color Cartridge Yield Up to 3,216 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP74XL	K (Black)	713	689	9/10
HP75XL	Tri-color	505	491	12/15

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP74XL	K (Black)	816	793	9/9
HP75XL *	Tri-color	3,282	3,216	3/3

* Denotes supplemental cartridge

Printer Identifier	HP Photosmart C5280
Printer Manufacturer	Hewlett-Packard
Cartridge Identifier	HP74XL, HP75XL
Cartridge Type	Integral ink supply and print head
Date Tested	July 23, 2007 to July 25, 2007
EOL Criteria	Fade
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo paper
Media used	HP Premium Plus High-gloss Photo Paper (Q1785A)
Driver version	Driver Version = 03/15/2007,61.071.244.00 The following settings were used: Photo printing-with white borders Print Quality = Best Paper Type = HP Premium Plus Photo Paper

Declaration of Yield

Inkjet Cartridge Yield when tested in Hewlett-Packard Photosmart C5280 All-in-One:

Using the QualityLogic Color Photo test suite provides the following results:

Average Tri-color Cartridge Yield – Up to 139 standard pages

Estimated supplemental K (Black) Cartridge Yield – Up to 5,190 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP75XL	Tri-color	144	139	9/9
HP74XL *	K (Black)	6,173	5,190	3/3

* Denotes supplemental cartridge

Printer Identifier	HP Photosmart C6380
Printer Manufacturer	Hewlett-Packard
Cartridge Identifier	HP564XL - CB321WN, CB322WN, CB323WN, CB324WN, CB325WN
Cartridge Type	Separate ink supply and print head
Date Tested	October 21, 2008 to November 17, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	Driver Version = 61.81.2311.0 The following driver settings were changed from default: Color Ink Test: Paper type = Changed to Plain paper from Automatic Mono Ink Test: Paper type = Changed to Plain paper from Automatic Print all text as black was enabled in the Advanced tab.

Declaration of Yield

Inkjet Cartridge Yield when tested in HP Photosmart C6380 All-in One:

Using the test suite defined in ISO/IEC 24712 provides the following results:

- Average K (Black) Cartridge Yield – Up to 777 standard pages
- Average Cyan Cartridge Yield – Up to 781 standard pages
- Average Yellow Cartridge Yield – Up to 680 standard pages
- Average Magenta Cartridge Yield – Up to 813 standard pages
- Estimated supplemental K (Photo Black) Cartridge Yield – Up to 3,390 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

- Average K (Black) Cartridge Yield – Up to 827 standard pages
- Estimated supplemental Cyan Cartridge Yield – Up to 7,006 standard pages
- Estimated supplemental Yellow Cartridge Yield – Up to 8,441 standard pages
- Estimated supplemental Magenta Cartridge Yield – Up to 8,692 standard pages
- Estimated supplemental K (Photo Black) Cartridge Yield – Up to 10,405 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP 564XL (CB321WN)	K (Black)	791	777	9/12
HP 564XL (CB323WN)	Cyan	803	781	9/12
HP 564XL (CB325WN)	Yellow	707	680	9/12
HP 564XL (CB324WN)	Magenta	838	813	9/9
HP 564XL (CB322WN)*	K (Photo Black)	3,793	3,390	3/3

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP 564XL (CB321WN)	K (Black)	828	827	9/10
HP 564XL (CB323WN)	Cyan	7,416	7,006	3/4
HP 564XL (CB325WN)	Yellow	8,601	8,441	3/4
HP 564XL (CB324WN)	Magenta	8,750	8,692	3/4
HP 564XL (CB322WN)*	K (Photo Black)	10,581	10,405	3/4

* Denotes supplemental cartridge

Printer Identifier	HP Photosmart C6380
Printer Manufacturer	Hewlett-Packard
Cartridge Identifier	HP564XL - CB321WN, CB322WN, CB323WN, CB324WN, CB325WN
Cartridge Type	Separate ink supply and print head
Date Tested	October 29, 2008 to November 7, 2008
EOL Criteria	This printer has Ink Out which stops printing. Whichever came first, either Ink Out or Fade, was used as the EOL criteria.
Print mode used	Continuous
Paper Size	4" x 6" borderless photo on 8 ½" x 11" photo
Media used	HP Premium Plus Photo Paper (Q1785A)
Driver version	Driver Version = 61.81.2311.0 The following driver settings were changed from default: Paper type = Changed to HP Premium Plus Photo papers from Automatic Print quality = Changed to Best from Automatic

Declaration of Yield

Inkjet Cartridge Yield when tested in HP Photosmart C6380 All-in-One:

Using the QualityLogic Color Photo test suite provides the following results:

- Average Cyan Cartridge Yield – Up to 261 standard pages
- Average Yellow Cartridge Yield – Up to 309 standard pages
- Average Magenta Cartridge Yield – Up to 456 standard pages
- Average K (Photo Black) Cartridge Yield – Up to 255 standard pages
- Estimated supplemental K (Black) Cartridge Yield – Up to 5,532 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
HP 564XL (CB323WN)	Cyan	265	261	15/18
HP 564XL (CB325WN)	Yellow	314	309	12/15
HP 564XL (CB324WN)	Magenta	474	456	9/9
HP 564XL (CB322WN)	K (Photo Black)	260	255	15/18
HP 564XL (CB321WN)	K (Black)*	5,926	5,532	3/3

* Denotes supplemental cartridge

Printer Identifier	Lexmark X6650 Wireless 4-in-1
Printer Manufacturer	Lexmark
Cartridge Identifier	36XLA, 37XLA
Cartridge Type	Integral ink supply and print head
Date Tested	October 31, 2008 to November 5, 2008
EOL Criteria	Fade was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	DriverVer=05/23/2008,1.2.6.2 The following driver settings were changed from default: Color Ink Test: Media Type = Changed to Plain Paper from Automatic Mono Ink Test: Media Type = Changed to Plain Paper from Automatic "Print in Black and White" was enabled on the Print Setup tab.

Declaration of Yield

Inkjet Cartridge Yield when tested in Lexmark X6650 Wireless 4-in-1:

Using the test suite defined in ISO/IEC 24712 provides the following results:

Average K (Black) Cartridge Yield – Up to 571 standard pages

Average Tri-color Cartridge Yield – Up to 550 standard pages

Using the test page defined in ISO/IEC 19752 provides the following results:

Average K (Black) Cartridge Yield – Up to 580 standard pages

Estimated supplemental Tri-color Cartridge Yield – Up to 105,425 standard pages

Values obtained by continuous printing. Declared yield values in accordance with ISO/IEC 24711

ISO 24712

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
36XLA	K (Black)	588	571	9/10
37XLA	Tri-color	571	550	9/11

ISO 19752

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
36XLA	K (Black)	590	580	9/9
37XLA *	Tri-color	110,250	105,425	3/3

* Denotes supplemental cartridge

Printer Identifier	Lexmark X6650 Wireless 4-in-1
Printer Manufacturer	Lexmark
Cartridge Identifier	36XLA, 37XLA
Cartridge Type	Integral ink supply and print head
Date Tested	November 5, 2008 to November 10, 2008
EOL Criteria	Fade was used as the EOL criteria.
Print mode used	Continuous
Paper Size	Letter
Media used	Xerox Business 4200, 92 Brightness 20lb. weight
Driver version	DriverVer=05/23/2008,1.2.6.2 The following driver settings were changed from default: Media Type = Changed to Lexmark Premium Photo Paper from Automatic Print Setup = Changed to Best from Automatic

Declaration of Yield

Inkjet Cartridge Yield when tested in Lexmark X6650 Wireless 4-in-1:

Using the QualityLogic Color Photo test suite provides the following results:

Average Tri-Color Cartridge Yield – Up to 110 standard pages

Estimated supplemental (Average) K (Black) Cartridge Yield – Up to 12,740 standard pages

Values obtained by continuous printing. Declared yield values in accordance with QualityLogic Color Photo Yield Test Methodology

QualityLogic Color Photo Suite

Cartridge Identifier	Color	Average (pages)	90% Lower Confidence (pages)	Number used in calculations/test
37XLA	Tri-color	114	110	9/9
36XLA *	K (Black)	13,460	12,740	3/3

* Denotes supplemental cartridge

Sub-Appendix A1 – Test Pages

ISO/ ISO/IEC 24712 Test Suite



ISO/IEC 19752 Test Page



QualityLogic Photo Test Suite

