QualityLogic Performance Report

- Hewlett-Packard Color LaserJets vs. Laser Competitors -

QualityLogic Inc., an independent test firm, recently performed tests to compare the print throughput performance of seven current or recently-introduced Hewlett-Packard Color LaserJet printers against a selection of currently available competitive products from various manufacturers. The devices chosen for this test span a broad range of performance and price points. The testing demonstrated that the Hewlett-Packard Color LaserJets printed documents typical of a small/medium business environment faster from power save even when compared against printers rated at a higher PPM (Pages-Per-Minute).

Enabled by Instant-on Technology, the Hewlett-Packard printers delivered, on average, all of the pages in the print jobs sooner than the other printers tested, resulting in faster throughput for the entire job. In addition, in no case was a Hewlett-Packard printer slower in completing the print jobs than a competitor with the same or lower price and similar or faster PPM specification.

Printer specifications may provide PPM rated throughput without indication of the warm-up time required prior to printing. These tests included the warm-up time when printing a typical job from the printer power-save mode that a small/medium business user will experience. Test documents of five pages each were printed 30 minutes after having ensured that each printer entered its power-save mode.

Under these test conditions, the Hewlett-Packard Color LaserJets outperformed the competitors with similar and higher price/performance points. This data represents the average print time of all five-page documents printed from five test applications.

The following table shows the printers tested, their manufacturer-specified print speed for letter size paper and first page out (FPO) times, if available, compared to the actual performance achieved during testing by QualityLogic. The devices in the test are order ranked from fastest, at the top, to slowest based on the average time to print all of the five-page jobs. (This column is highlighted in blue.) The Hewlett-Packard printers are highlighted in green and occupy seven of the top twenty two, or fastest, positions in the set of test results.

The column titled “Warm Up” in the table includes the apparent average warm up time required for each printer. This calculation is based on the difference between the average times to print the first page of each print job when the printer is cold and warm. The Hewlett-Packard printers are significantly faster due to the Instant-on Technology.

Printer	List Price	Published Specifications		Actual Performance (All times in Seconds)			
		Speed (PPM) (4)	FPO (sec.) (4)	Warm Up	First of five	Third of five	Fifth of five
HP CLJ4700n	$1,999 (1)	31	10	4.9	15.5	19.3	25.0
HP CLJ3800dn	$799 (1)	22	12.5	0.8	12.8	18.2	25.2
Xerox Phaser 6350DP	$1,799 (1)	36	10	8.3	19.4	22.6	25.9
Xerox Phaser 6300DN	$1,299 (1)	36m/26c	12	6.6	19.8	24.3	28.9
HP CLJ3600n	$699 (1)	17	14	0.9	14.6	21.3	29.2
HP CLJ3000dn	$1,199 (1)	30m/15c	15	0.2	16.2	22.8	29.4
Ricoh Aficio CL3500N	$699 (3)	22	13.5m/14.5c	6.3	26.8	32.2	37.6
Konica Minolta 5450	$1,499 (1)	27	14.1	13.6	30.6	35.0	39.4
Ricoh SP C411DN	$1,399 (3)	31	10m/15c	16.2	32.2	35.9	41.4
Konica Minolta 5440DL	$999 (1)	27	14.1	15.7	32.9	37.3	41.7
Dell 3110cn	$499 (1)	31m/17c	*	17.6	31.2	38.0	44.8
Konica Minolta 5430DL	$799 (1)	21	14.1	15.9	33.8	39.4	45.1
Okidata C5800Ldn	$800 (3)	28m/24c	10m/11c	26.0	38.8	43.5	48.2
Okidata C5500n	$610 (3)	24m/20c	10m/11c	22.8	37.2	48.6	48.6
Okidata C6100n	$890 (3)	32m/26c	9m/11c	29.6	40.6	44.9	49.3
HP CLJ2600n	$399 (1)	8	20	0.1	22.9	37.1	51.1
HP CLJ1600	$299 (1)	8	20	0.1	22.7	37.1	51.1
Dell 5110cn	$999 (1)	40m/35c	*	37.6	50.0	53.2	56.5
Lexmark C760	$999 (1)	25	15	25.3	50.5	55.3	59.8
Lexmark C762	$1,499 (1)	25	15	26.0	51.2	56.1	60.6
Samsung CLP-600N	$489 (3)	21	20	39.1	52.8	58.5	64.2
HP CLJ2605dn	$499 (1)	8	20	0.2	26.7	45.8	66.1
Okidata C3200	$367 (2)	20m/12c	9m/14c	26.0	48.4	58.0	67.6
Kyocera FS-C5030N	$2,625 (1)	26	12	41.5	60.7	65.7	70.7
Lexmark C500	$399 (1)	31m/8c	13m/19c	26.1	48.2	63.1	78.0
Lexmark C522n	$499 (1)	20	13	53.4	69.7	75.7	82.3
Lexmark C524n	$699 (1)	20	13	55.5	70.8	76.8	82.8
Dell 3010cn	$379 (1)	25m/5c	*	16.0	37.1	60.7	84.4
Ricoh Aficio CL1000N	$899 (1)	31m/8c	14m/20c	38.0	55.2	70.1	85.1
Epson Aculaser C1100	$340 (2)	25m/5c	9m/17c	19.7	38.7	62.3	85.8
Epson C2600N	$802 (2)	30m/7.5c	9.3m/15.3c	45.8	63.0	79.0	95.0
Konica Minolta 2400W	$399 (1)	20m/5c	14m/23c	34.9	57.6	83.3	107.1
Xerox Phaser 6120	$499 (1)	20m/5c	13m/22c	22.7	52.3	80.7	110.4
Samsung CLP 510	$399 (3)	25m/6c	13m/21c	59.6	81.1	101.0	120.9

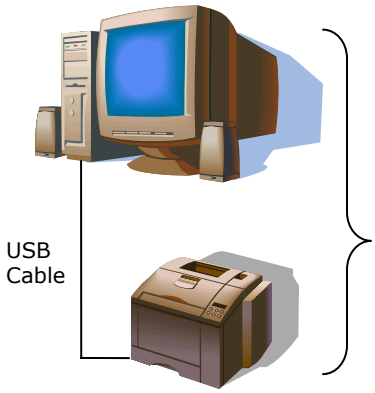
Notes:

(1) – Price obtained from manufacturers web site for base model in series.
(2) – Actual price paid in UK £, exchange rate at time of purchase was used to convert to US dollars.
(3) – Price obtained from on-line retailer in US.
(4) – Where monochrome (m) and color (c) specifications differ, they are noted.

* Manufacturer does not provide this information on their web site or in accompanying manuals.

Test Platform

Testing was performed using the QualityLogic PageSense 4.2 automated performance test tool, connected to a desktop personal computer with an Intel P4 3.2GHz processor with 2GB of memory, using the Microsoft Windows XP Professional Edition operating system with Service Pack 2. All printers were connected to the test computer using a USB connection.



PageSense Performance Measurements

"First Page Out"
User clicks Print to first page in output bin
"Last Page Out"
Total time for entire print job

Test Approach

All print drivers were installed using the Plug-n-Play method and tested using the default settings. Printing was done on letter size paper. All products were selected by Hewlett-Packard and purchased by QualityLogic from various vendors.

Each printer was tested using the default settings as delivered from the manufacturer. No modifications were made to the printer or driver settings.

Based on Hewlett-Packard's belief that typical print jobs for the small/medium business environment are between one and five pages, documents of five pages in length were chosen for this test.

For all printers, each test file was printed 30 minutes after having ensured that the printer entered the power-save state. PageSense was used to automate the testing and provide consistent timing between tests. All files were printed twice. Any files logging a five percent deviation between test runs were retested.

QualityLogic selected test files that it considered typical of a small/medium business environment from PageSense's suite of performance test files. The test included files from Microsoft Internet Explorer 6.0, Microsoft Office 2000 Suite, and Adobe Acrobat Reader 6.0. Standard PageSense test files were modified to fit the five-page document length requirements of this test.

PageSense uses application test files and an automated process for printing and recording time measurements using a smart paper sensing unit. Performance data is logged into a database automatically. Many leading printer manufacturers and

industry publications, such as PC Magazine, use PageSense to automate testing and provide comparable results between printers. PageSense is a standard, automated approach to performance testing.

This study was commissioned by Hewlett-Packard.

About QualityLogic

QualityLogic is a leading Software Quality Services Company offering a variety of testing services and related tools focused on the conformance, performance, and interoperability testing needs, from low level firmware testing, to high level multi-tier application testing. QualityLogic has over 18 years' experience, both in developing specialized test tools and providing comprehensive testing services for top industry manufacturers.

Test results provided by QualityLogic. Tests were performed under laboratory conditions and your results may vary.