



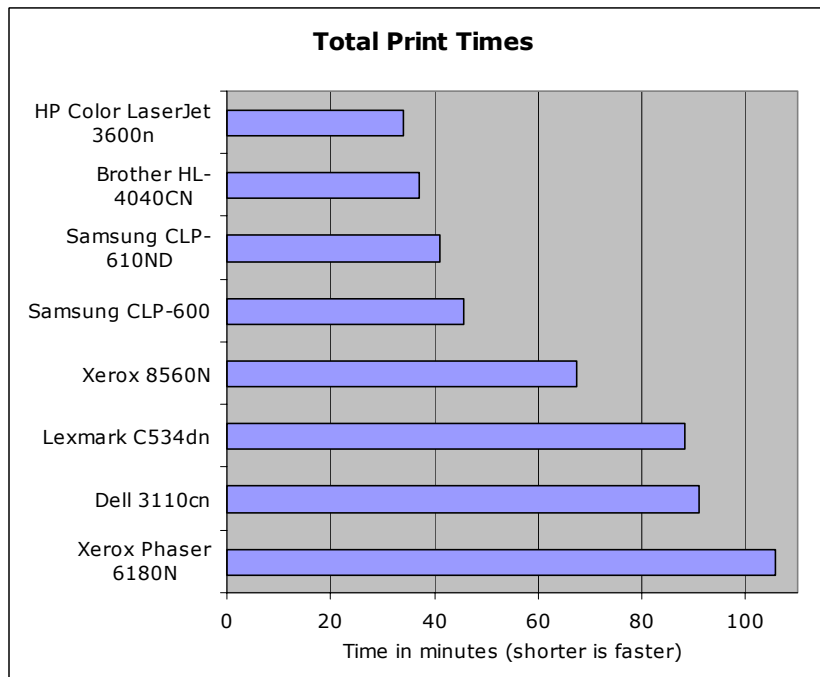
QualityLogic Performance Report

- HP Color LaserJet 3600n vs. Laser Competitors -

QualityLogic Inc., a leading independent test firm, recently conducted tests to compare the print throughput performance of the HP Color LaserJet 3600n with a selection of competitive products from various manufacturers. The testing demonstrated that the HP Color LaserJet 3600n printed documents similar to those found in a business environment faster than the competition when each printer was configured to achieve the best print quality possible. In addition, a sampling of print quality from each of the printers in the test shows that the HP Color LaserJet 3600n achieves equivalent or better print quality than the other printers tested. Some of the print quality samples are included later in this report.

A printer's primary speed specification (the "up to" PPM rating) is based on the speed of the printer in the fastest mode available, often not the best print quality mode. Speed capabilities for printing in the best print quality modes are often not provided. Five of the six printers in the test had multiple print quality modes in their drivers that were evaluated. Of those five printers, all printed slower in their best print quality mode than in their other print mode.

Printers were initially configured to print in their best print quality. QualityLogic's PageSense Business Suite 2003 was used, which consists of test files from several desktop applications that average six to seven pages in length. The entire test suite has a total of 352 pages. Total print times to print the entire suite are provided in the graphs and table that follow:

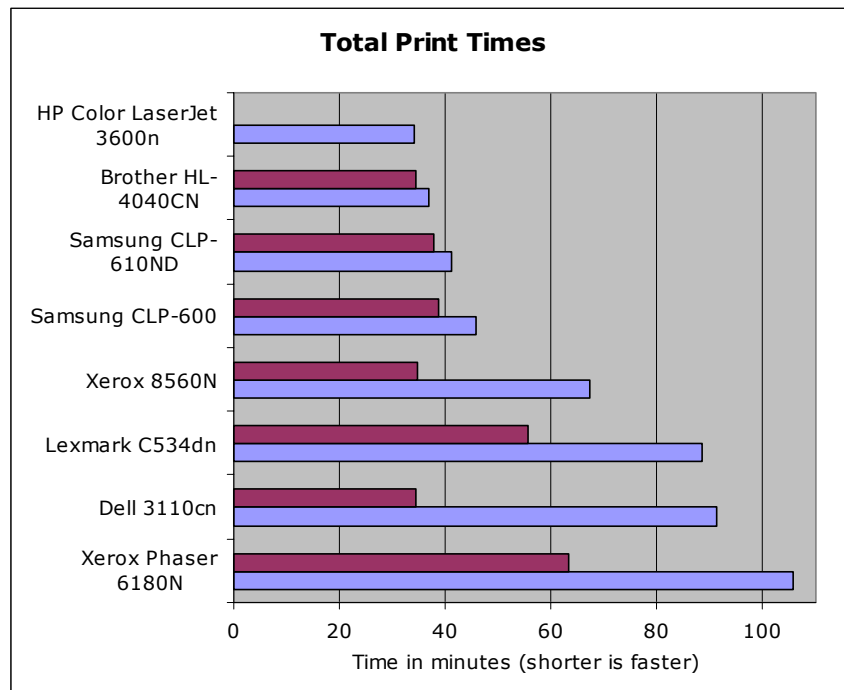


Graph 1: Comparison of all printers in their best print quality modes. (Six applications, 52 documents and 352 total pages.)

The above graph shows the cumulative time in minutes to print the complete test suite on each of the printers in the test, when the printers were configured to their best print quality mode. The HP Color LaserJet 3600n printed the suite faster than the other printers tested.

The test was repeated using the default mode for those printers with higher speed default settings. The graph below compares the time for those printers to print the same test suite in their default modes (maroon bars) with the time to print the test suite in their best quality modes (blue bars). For the HP Color LaserJet 3600n there is only a single bar since this printer only had one mode of printing, the best print quality mode.

Under these default test conditions, the HP Color LaserJet 3600n outperformed all of the competitors.



Graph 2: Comparison of all printers in best print quality and default modes. (Six applications, 52 documents and 352 total pages.) ^{2, 3} (See page 3)

The following table shows the printers tested, their manufacturer-specified print speed, and the tested performance achieved in both best print quality and default modes during testing by QualityLogic:

Printer ¹ Published "up to" pages per minute (PPM) speed	Tested Performance Best print quality mode	Tested Performance Default mode
	Time to print 352 pages	Time to print 352 pages
HP Color LaserJet 3600n Up to 17 PPM	34.0 Minutes	34.0 Minutes ²
Brother HL-4040CN Up to 21 PPM	36.9 Minutes	34.4 Minutes
Samsung CLP-610ND Up to 21 PPM	41.2 Minutes	37.7 Minutes
Samsung CLP-600 Up to 21 PPM	45.7 Minutes	38.6 Minutes
Xerox Phaser 8560N Up to 30 PPM	1 hour 7.3 Minutes	34.6 Minutes
Lexmark C534dn Up to 24 PPM	1 Hour 28.3 Minutes ³	55.7 Minutes
Dell 3110cn Up to 31m/17c PPM	1 hour 31.1 Minutes	34.5 Minutes
Xerox Phaser 6180N Up to 26m/20c PPM	1 Hour 45.8 Minutes	1 Hour 3.1 Minutes

Six of the test pages from different applications in the test suite were chosen and used to judge print quality of the seven printers. In all cases pages that were printed in the best quality mode were used for the comparison. A forced ranking system was used to rank the pages from 1-6 for the seven printers in the study. The pages printed by the HP Color LaserJet 3600n consistently ranked best overall in this comparison. Following are samples from one of those test pages for each of the printers.

¹ Where mono and color speeds are different they are noted as m for mono and c for color.

² The HP Color LaserJet 3600n only has one mode of printing, their best print quality mode.

³ The Lexmark C534dn has three resolutions. They are Normal, Best and under the Custom menu 1200 dpi, the highest resolution, can be selected. The Custom 1200 dpi setting was used as the best print quality mode.



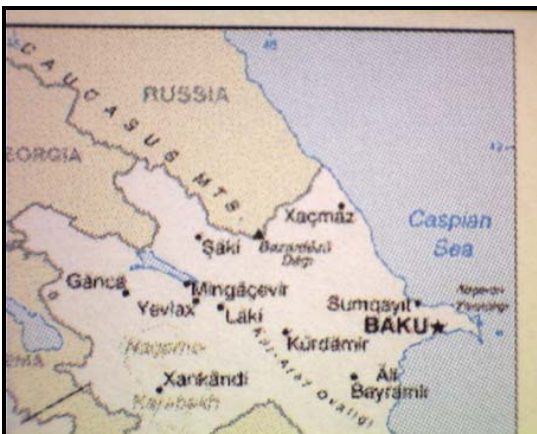
HP Color LaserJet 3600n



Original Document



Xerox Phaser 8560N



Samsung CLP-600



Dell 3110cn

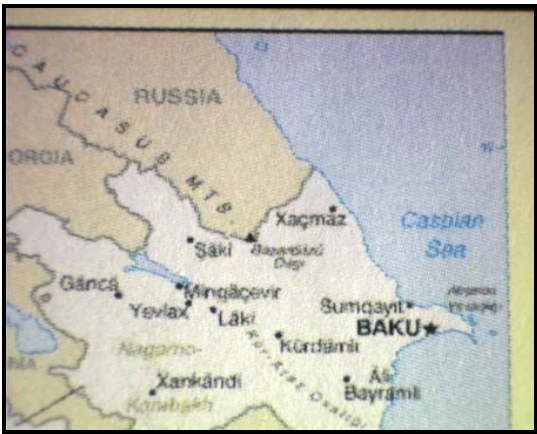


HP Color LaserJet 3600n

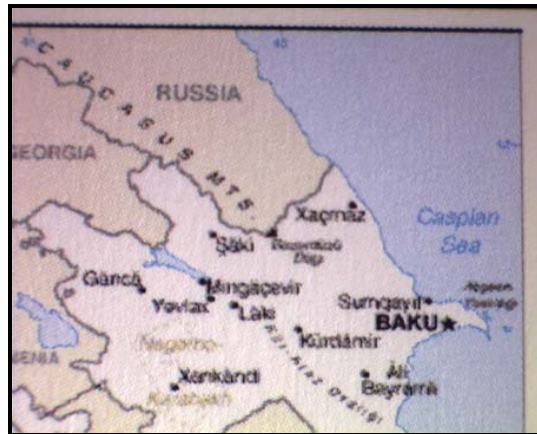
COUNTRY / FLAG	MAP	LOCATION	LONG. / LAT.	PEOPLE	ECONOMY
		Southwestern Asia, bordering the Caspian Sea, between Iran and Russia	49 00' N, 47 20' E	1,128,487	86
		Caribbean, island of islands in the North Atlantic Ocean, southeast of Florida	24 15' N, 76 20' W	300,628	175
		Middle East, southwestern in the Persian Gulf, west of Saudi Arabia	26 00' N, 50 33' E	400,387	161
		Oceania, island in the North Pacific Ocean, about half way between Hawaii and Australia	0 14' N, 178 21' W	0	239
		Southern Asia, bordering the Bay of Bengal, between Burma and India	24 00' N, 90 00' E	133,378,684	8
		Caribbean, island between the Caribbean Sea and the North Atlantic Ocean, northeast of Venezuela	13 10' N, 59 32' W	278,807	177

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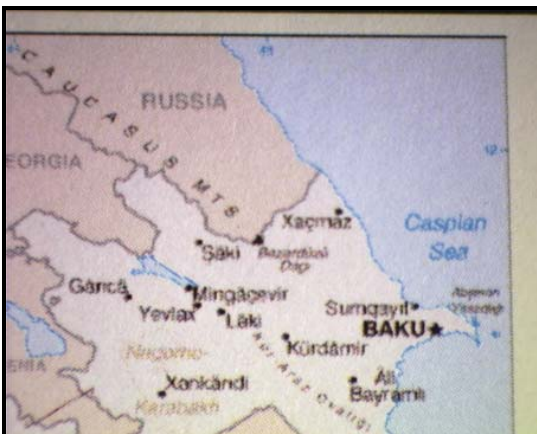
Original Document



Lexmark C534dn



Brother HL-4040CN



Xerox Phaser 6180N



HP Color LaserJet 3600n



Samsung CLP-610ND

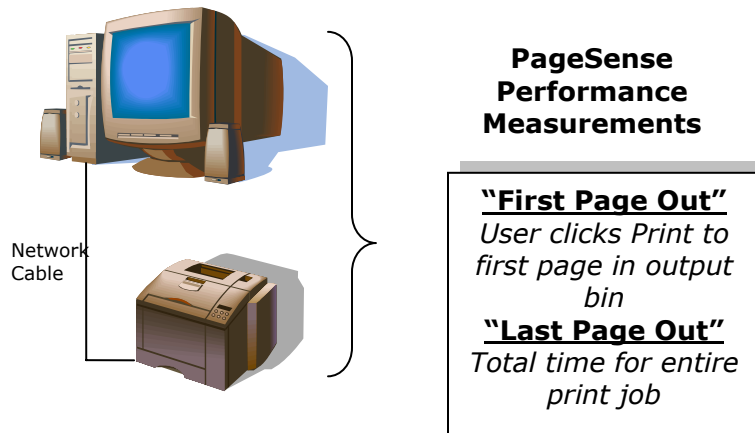
COUNTRY / FLAG	MAP	LOCATION	LONG. / LAT.	PEOPLE	RANKING
		Southwestern Asia, bordering the Caspian Sea, between Iran and Georgia	40 20' N, 47 20' E	7,708,497	86
		Caribbean, chain of islands in the North Atlantic Ocean, northwest of Florida	24 15' N, 76 20' W	300,029	175
		Middle West, southwesterly in the Western Sud, east of La Paz	26 00' N, 60 20' E	880,397	161
		Oceania, 450 in the North Pacific Ocean, about half way between Hawaii and Australia	0 12' N, 178 21' W	0	239
		Southern Asia, bordering the Bay of Bengal, between Burma and India	21 00' N, 90 00' E	123,378,684	8
		Caribbean, island between the Caribbean Sea and the North Atlantic Ocean, northeast of Venezuela	12 10' N, 59 22' W	278,507	177

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Original Document

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 high speed isolated network connection.



Test Approach

All print drivers were installed using the Plug-n-Play method and tested using the default printer language. The only exception to this rule was when the information provided by the manufacturer indicated that the best print quality was obtained when using a different language. In addition, default settings were used with the exception of those required to obtain the best print quality from the printer under test. All products were selected by HP and purchased by QualityLogic from various vendors.

For all printers, each test file was printed after having ensured that the printer was warm and not in a 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 PageSense Business Suite 2003 test files that it considers similar to those found in a business environment for this test. The test included files from Adobe Acrobat Reader 6, Adobe PhotoShop 7, Microsoft Internet Explorer 6, Microsoft Excel, PowerPoint and Word 2003. The test suite is composed of 52 documents from these applications with a total of 352 pages.

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

This study was commissioned by HP.

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 21 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.

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