

## HP Officejet Pro 8500 vs. Brother MFC-9440CN & Brother MFC-9840CDW

FEBRUARY 2009



HP Officejet Pro 8500



Brother MFC-9440CN



MFC-9840CDW

Specifications	HP Officejet Pro 8500	Brother MFC-9440CN	Brother MFC-9840CDW
Price (US \$)	\$299	\$599	\$699
Technology	Inkjet all-in-one printer (4 individual ink tanks)	Single-pass color laser multifunction printer	Single-pass color laser multifunction printer
Color Speed	11 ppm	21 ppm	21 ppm
Black Speed	15 ppm	21 ppm	21 ppm
Input Capacity	250 sheets	300 sheets	300 sheets
Duty Cycle	15,000 pages per month	35,000 pages per month	35,000 pages per month

## Executive Summary

In BLI's testing of the three entry-level color models—the inkjet HP Officejet Pro 8500 and the Brother MFC-9440CN and Brother MFC-9840CDW laser models—the HP model had a definite advantage in the electricity consumption evaluation, with the Officejet Pro 8500 consuming about 80 percent less electricity than both Brother models. The MFC-9840CDW had the advantage in color speed testing, while the MFC-9440CN was the fastest for color first-page testing.

## TEC Energy Consumption

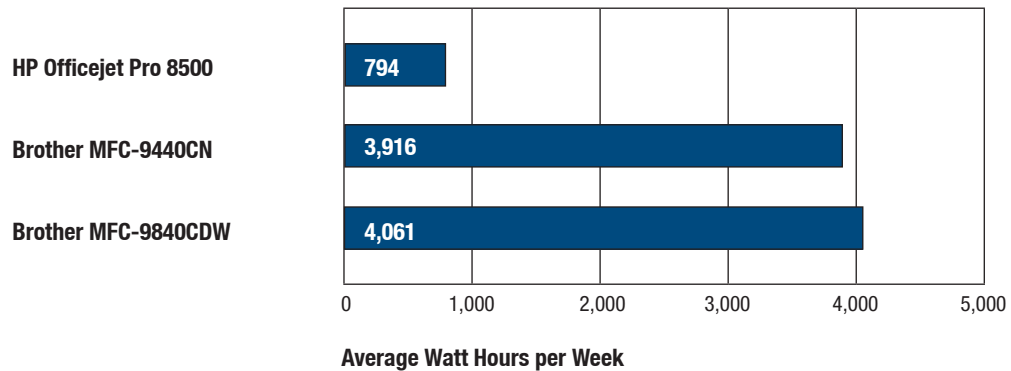
BLI conducted a comparative energy-consumption evaluation using the Energy Star Typical Electricity Consumption (TEC) method, with energy consumed recorded as watt-hours (Wh). The test is designed to replicate real world usage and measures energy consumed over a specified period, during which each device is in sleep mode, warm-up mode, ready mode and printing multiple single-sided sets of a 12-page black document. In this procedure, measurements are taken using a Yokogawa WT210 watt meter. For this competitive group, typical usage is assumed as being 288 pages per day, and the numbers reported are based on an average of two tests.

- In BLI’s electricity consumption testing, the HP Officejet Pro 8500 proved to be the most energy efficient device, followed by the Brother MFC-9440CN; the Brother MFC-9840CDW used the most electricity in BLI’s testing.
- Based on this testing, BLI projects that the HP Officejet Pro 8500 would consume an average of 794 Wh during a week of typical usage. It is also estimated that the Brother MFC-9440CN would consume an average of 3,916 Wh, while the Brother MFC-9840CDW would consume an average of 4,061 Wh in a week of typical usage.

## TYPICAL WEEKLY ELECTRICITY CONSUMPTION

MODEL	TOTAL TEC
HP Officejet Pro 8500	794 Wh
Brother MFC-9440CN	3,916 Wh
Brother MFC-9840CDW	4,061 Wh

## TYPICAL ELECTRICITY CONSUMPTION



Typical Electricity Consumption is calculated based on each device printing 288 pages per day, with the device spending the remainder of the time in sleep mode after printing is completed. A watt meter is used to determine power used during printing and in sleep mode for each device.

## Speed Testing (Color Mode)

BLI subjected each device to comparative print speed testing, using the ISO 24734 test suite with the devices in default mode, using the PCL driver. Each four-page file (PDF, Word and Excel) was printed three times and the time to completion indicates the time it took to print the second and third sets (for a total of eight pages). Times for each of the three tests were added together to get a total time to print 24 pages, which is reported in the chart below.

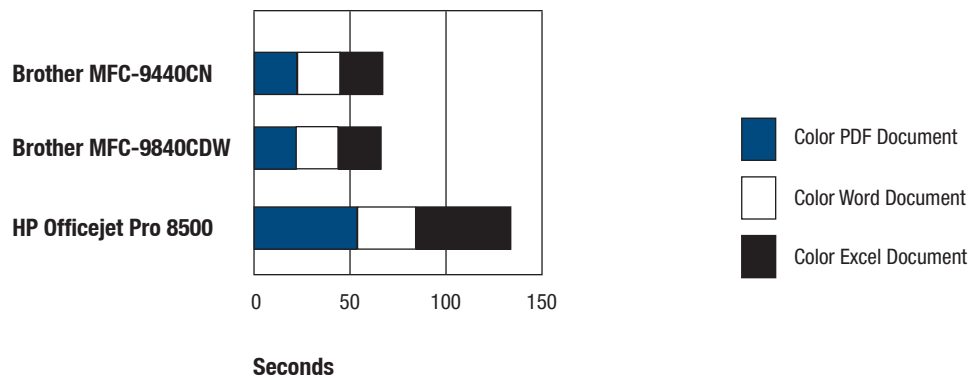
- When combining the time to print all three color documents, the MFC-9840CDW was the fastest, followed by the MFC-9440CN. The Officejet Pro 8500 was the slowest, taking about twice as long to print the files.
- When printing two sets of a four-page PDF document in color mode, the Brother MFC-9840CDW was the fastest, completing the test in 22.57 seconds, followed by the MFC-9440CN, at 22.77 seconds. The Officejet Pro 8500 was third, at 54.31 seconds.
- When printing two sets of a four-page Word document in color mode, the MFC-9840CDW was fastest, completing the test in 22.49 seconds, while the MFC-9440CN printed the eight pages in 22.86 second. The Officejet Pro 8500 was the slowest, at 30.58 seconds.
- When printing two sets of a four-page Excel document in color mode, the Brother MFC-9840CDW was the fastest, at 22.69 seconds, while the MFC-9440CN was the second fastest, completing the test in 22.86 seconds. The Officejet Pro 8500 was third, completing the test in 50.15 seconds.

## TIME TO PRINT ISO 24734 TEST SUITE (IN SECONDS)

	Color PDF Document (8 Pages)	Color Word Document (8 Pages)	Color Excel Document (8 Pages)	Total Time to Print All Three Files (24 Pages)
<b>Brother MFC-9840CDW</b>	<b>22.57</b>	<b>22.49</b>	<b>22.69</b>	<b>67.74</b>
<b>Brother MFC-9440CN</b>	22.77	22.86	22.86	68.49
<b>HP Officejet Pro 8500</b>	54.31	30.58	50.15	135.04

In this test, three sets of each four-page document are printed. Timing begins when the last page of the first set exits the device and ends when the last page of the third document set completely exits the device. This method eliminates the time required for job processing and for the device to get up to speed, effectively demonstrating the time to print eight pages (two sets of the document).

Note: Numbers in red indicate the fastest results.



Results above indicate time to print two sets of three four-page documents, for a total of 24 pages. Three sets of each four-page document are printed and the time to print the first set of each document is eliminated. Timing begins when the last page of the first set exits the device and ends when the last page of the third document set completely exits the device.

## First-Page-Out Times (Color Mode)

BLI subjected each device to comparative raster testing to determine which device had the fastest first-page-out times in color, using the ISO 24734 test suite with the devices in default mode, using the PCL driver.

- Based on an average of three documents tested, the Brother MFC-9440CN provided the fastest first-page time in color mode, followed by the Brother MFC-9840CDW and then the HP Officejet Pro 8500.
- When printing the ISO 24734 PDF document in color mode, the Brother MFC-9440CN had the fastest first-page-out time, at 15.72 seconds, while the Brother MFC-9840CDW was the second fastest, printing the first page in 15.87 seconds. The Officejet Pro 8500 was third, outputting the first page in 22.45 seconds.
- When printing the ISO 24734 Word document in color mode, the Brother MFC-9440CN was the fastest, taking 13.96 seconds to output the first page, while the MFC-9840CDW was the second fastest, printing the first page in 14.05 seconds. The Officejet Pro 8500 was third, outputting the first page in 14.20 seconds.
- When printing the ISO 24734 Excel document in color mode, the Brother MFC-9440CN had the fastest first-page-out time, at 14.85 seconds, while the Brother MFC-9840CDW was the second fastest, printing the first page in 15.36 seconds. The Officejet Pro 8500 was third, outputting the first page in 15.84 seconds.

### FIRST-PAGE TIMES (COLOR MODE; IN SECONDS)

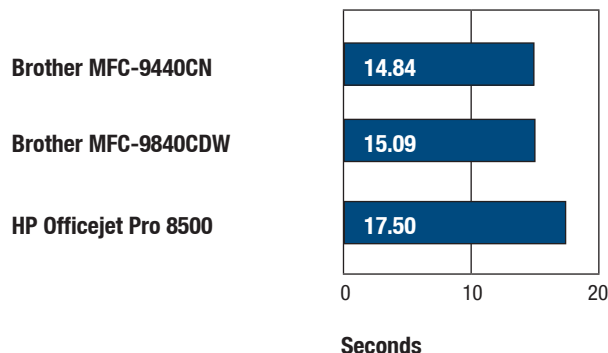
	PDF	Word	Excel	Average First-Page Time
<b>Brother MFC-9440CN</b>	<b>15.72</b>	<b>13.96</b>	<b>14.85</b>	<b>14.84</b>
<b>Brother MFC-9840CDW</b>	15.87	14.05	15.36	15.09
<b>HP Officejet Pro 8500</b>	22.45	14.20	15.84	17.50

First-page time indicates the time it took to process the file and deliver the first page of the test document set to the output tray.

Note: Fastest times are indicated in red.

### AVERAGE FIRST-PAGE TIMES

Average first-page time is based on an average of three file types tested (PDF, Word and Excel). Each file is printed twice to get an average first-page time for each file type; the average first-page time is determined by averaging the results for each of the three file types.



## SUPPORTING TEST DATA

### Test Objective

Buyers Laboratory Inc. (BLI) was commissioned by Hewlett-Packard to conduct an independent comparative performance evaluation of the HP Officejet Pro 8500 versus the Brother MFC-9840CDW and Brother MFC-9440CN. Tests performed include color speed testing, color first-page-out testing and TEC energy consumption testing.

### Test Environment

This test was conducted in BLI's 10,000-square-foot U.S. test lab, in an environment monitored by an Extech RH S20 RH/Temp recorder and a Honeywell Temp/RH chart recorder, which replicates typical office conditions.

### Test Equipment

BLI's dedicated test network, consisting of Windows NT 4.0, 2000 and Microsoft Exchange servers, Windows 2000 and XP workstations, 10BaseT/100BaseTX network switches and CAT5 cabling.

### Test Duration

Products were tested for 2,500 impressions.

### Tested Models

Six devices, two of each model (HP Officejet Pro 8500, Brother MFC-9840CDW and Brother MFC-9440CN).

### Test Procedures

The test methods and procedures employed by BLI in its lab testing include a range of BLI and industry-standard test targets. For speed testing, the ISO 24734 test suite was used. For electricity consumption testing, the Energy Star Typical Electricity Consumption (TEC) for laser printers was used to determine typical weekly electricity consumption.

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