

Summary Report

Comparative Study: *hp designjet 5500ps* *vs. hp designjet 5000ps and vs. Epson Stylus Pro 10000*

The *SpencerLab* Digital Color Laboratory, a division of Spencer & Associates Publishing, Ltd., has conducted independent comparative testing and analysis of Hewlett-Packard's **hp designjet 5500ps** large-format printer. The comparison evaluated *Throughput Speed Performance* of the **hp designjet 5500ps** with internal RIP (dj5500ps), both 42-inch and 60-inch models¹, the **hp designjet 5000ps** with internal RIP (dj5000ps), and the **Epson Stylus Pro 10000** with an optional EFI Fiery Spark Professional RIP (SP10000). The comparative evaluation utilized representative real-world files from the large-format version of the *SpencerLab* Printer Test Suite², including files from photographic and retail applications, and a GIS image.

The *SpencerLab* Digital Color Laboratory is an independent test laboratory with a broad base of industry clients. Although conducted under Hewlett-Packard sponsorship, *SpencerLab* believes these test results maintain its reputation for the integrity of its procedures and analyses. Results stated herein are based upon testing of actual products believed to be representative.

Summary

Based upon these tested documents, the new hp designjet 5500ps printer provides up to more than two times the performance of the Epson Stylus Pro 10000 in total print time at maximum image quality. The hp designjet 5500ps also provides up to two times the performance of the predecessor hp designjet 5000ps printer in day-to-day production image quality modes.

In a simulated eight-hour Print Service Provider workday, the **hp designjet 5500ps** provided up to 178% faster productivity over the **Epson SP10000**, utilizing sets of the tested documents³. In addition to speed, the **dj5500ps** simplifies the printing workflow by allowing the user to easily and quickly send files to the printer directly, without having to open applications.

Throughput Speed

Methodology

Five test documents were selected: four from the large-format version of the *SpencerLab* Test Suite, and a GIS image from Tore Tønning of Statens kartverk Sogn og Fjordane for, collectively representing an appropriate range of user applications for this group of large-format printers:

Castle (Adobe Photoshop 7.0 TIFF, 40" x 54", 324MB, 1 copy) – sRGB photograph

Covered Bridge (Adobe Photoshop 7.0 TIFF, 40" x 30", 68MB, 1 copy) - sRGB photograph

Apples (Acrobat 5.0 PDF, 40" x 49", 3 copies) – mixed text, color graphics, and photograph

Flowers (Adobe Acrobat 5.0 PDF, 47" x 34", 2 copies) – mixed text and photograph

Gloppen Tourist and Hiking Map – Norwegian Mapping Authority N50, a GIS plot (Adobe Photoshop, 58" x 39.3", 1 copy) – mixed text, color graphics, and photograph



The individual test files were sent to each RIP/printer via 100BaseT connectivity from a Macintosh client. The architecture of the hp dj5500ps and dj5000ps allow a direct workflow where files were sent directly from the client to the printers. The Epson SP10000 requires an external RIP; therefore, files

were sent from the client to the printer through a Windows 2000 server. Connectivity configurations for each printer are detailed below:

Printer	Client	Server	Connection	File Sent Via
Epson Stylus Pro 10000	PowerMac G4, 400 MHz, 512 MB RAM, 10 GB HD, Mac OS 9.1	Dell Dimension 4300, 1.6 GHz, 640 MB RAM, 30 GB HD, Windows 2000 (recommended with EFI Fiery Spark Professional RIP)	Client to Server: 100BaseT switch Server to Printer: Firewire	Application via Driver
hp designjet 5500ps		Not Required	Client to Printer: 100BaseT switch	WebSubmitter Direct
hp designjet 5000ps		Not Required	Client to Printer: 100BaseT switch	Application via Driver

TOTAL PRINT TIME was measured from the initial download time – when the file was opened on the SP10000 and dj5000ps, or was sent to the Web-Submitter on the dj5500ps – until the printers completed the job and the control panel returned to a READY state. Incremental times include APPLICATION RELEASE/SEND⁴, WORK RELEASE/PROCESSING⁵, RIP END, ENGINE START, PRINT END, and PRINT CUT. All timings are recorded for each test document over several iterations to assure accurate results⁶. The *SpencerLab* test procedure downloads the files to the printer for each iteration, measuring all of the above-mentioned increments. Files were not stored in the printers’ RIPs.

Test Documents	Epson Stylus Pro 10000	hp designjet 5500ps 60"	hp designjet 5500ps 42"	hp dj5000
<i>Castle</i>	1440x720 High Speed, Bi-directional OFF, Photo Glossy Media, Portrait	Not tested	Max Quality, Photo Imaging Gloss Media, Portrait	Max Quality, Photo Imaging Gloss Media, Portrait
<i>Covered Bridge</i>	720x720 High Quality, Photo Glossy Media, Landscape	Not tested	Production, Productivity Photo Gloss Media, Landscape	Productivity, Productivity Photo Gloss Media, Landscape
<i>Apples</i>	1440x720 High Quality, Photo Glossy Media, Portrait	Productivity, Productivity Photo Gloss Media, Landscape	Productivity, Productivity Photo Gloss Media, Portrait	Productivity, Productivity Photo Gloss Media, Portrait
<i>Flowers</i>	720x720 High Quality, Presentation Matte Media, Portrait	Production, Heavy Weight Coated Media, landscape	Production, Heavy Weight Coated Media, Portrait	Productivity, Heavy Weight Coated Media, Portrait
<i>Gloppen</i>	1440x720 High Quality, Photo Glossy Media, Portrait	Productivity, Photo Imaging Gloss Media, Landscape	Productivity, Photo Imaging Gloss Media, Portrait	Productivity, Photo Imaging Gloss Media, Portrait

To acquire comparable results for throughput performance testing, the printers were tested in similar Print Quality modes. Since each printer has unique operating modes, a print quality comparison was performed in order to select these comparable modes. A test file was printed on comparable media in various individual print modes for each printer. The results were then reviewed to establish similar print modes for all the printers. The resultant mode selections are detailed in the table above.

Test Results

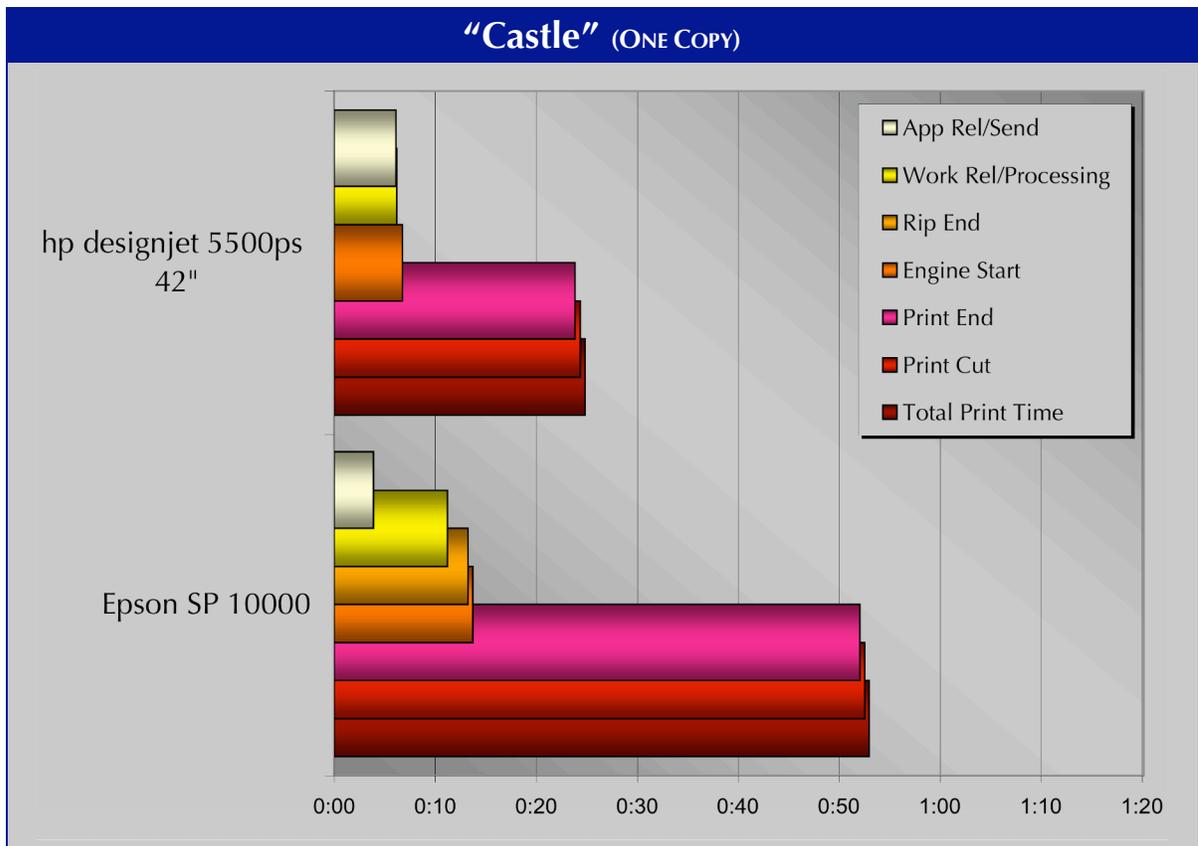
As noted above, with these tested documents, the new hp designjet 5500ps printer provides total print time performance up to more than twice that of the Epson Stylus Pro 10000 at maximum image quality.

The hp designjet 5500ps also provides up to two times the performance of the predecessor hp designjet 5000ps printer in day-to-day production image quality modes.

These two performance comparisons are detailed below.

Comparison: Hewlett-Packard designjet 5500ps—Epson Stylus Pro 10000

“Castle”

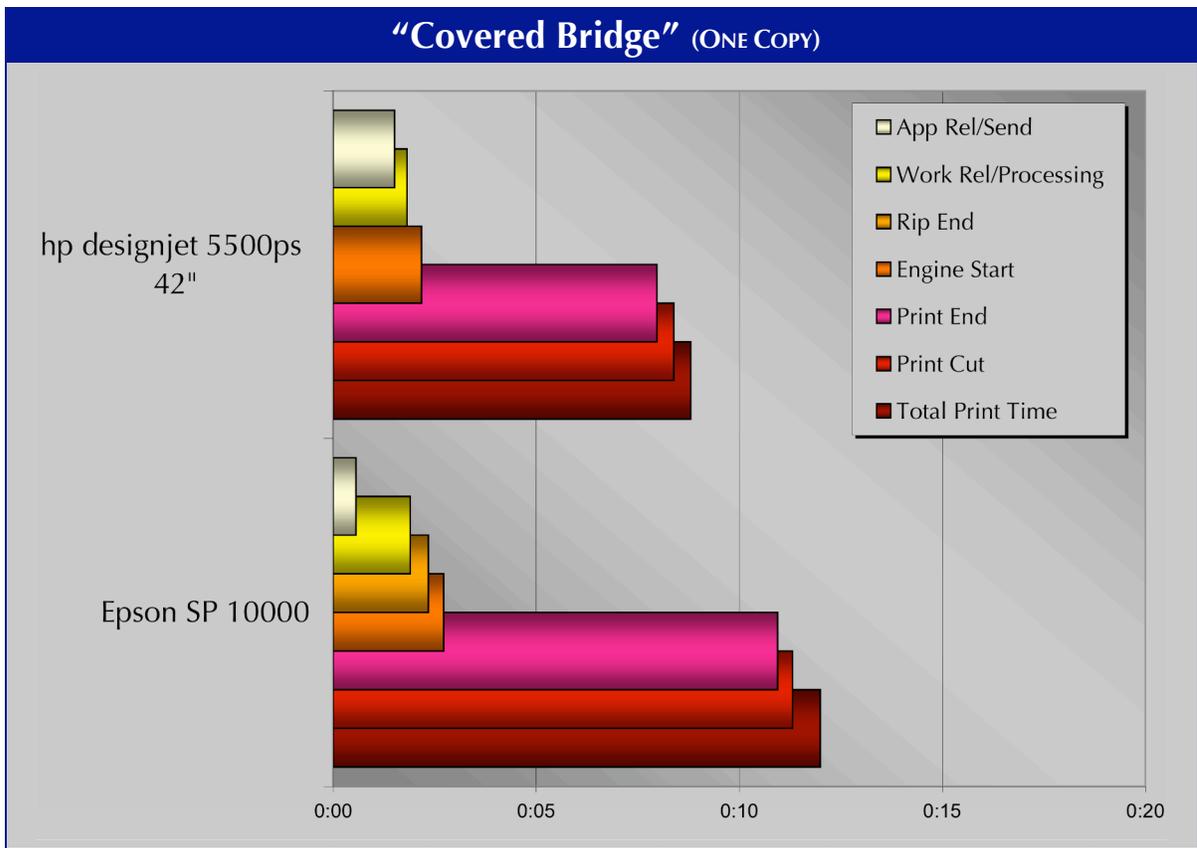


The 42" dj5500ps produced the *Castle* file more than twice as fast as the SP10000. While the dj5500ps produced this file in 24:52⁹, the SP10000 took half an hour longer at 52:58¹⁰.

Both MECHANICAL PRINT TIME (ENGINE START until PRINT END) and RIP time were quick on the dj5500ps, also more than twice as fast as the SP10000.

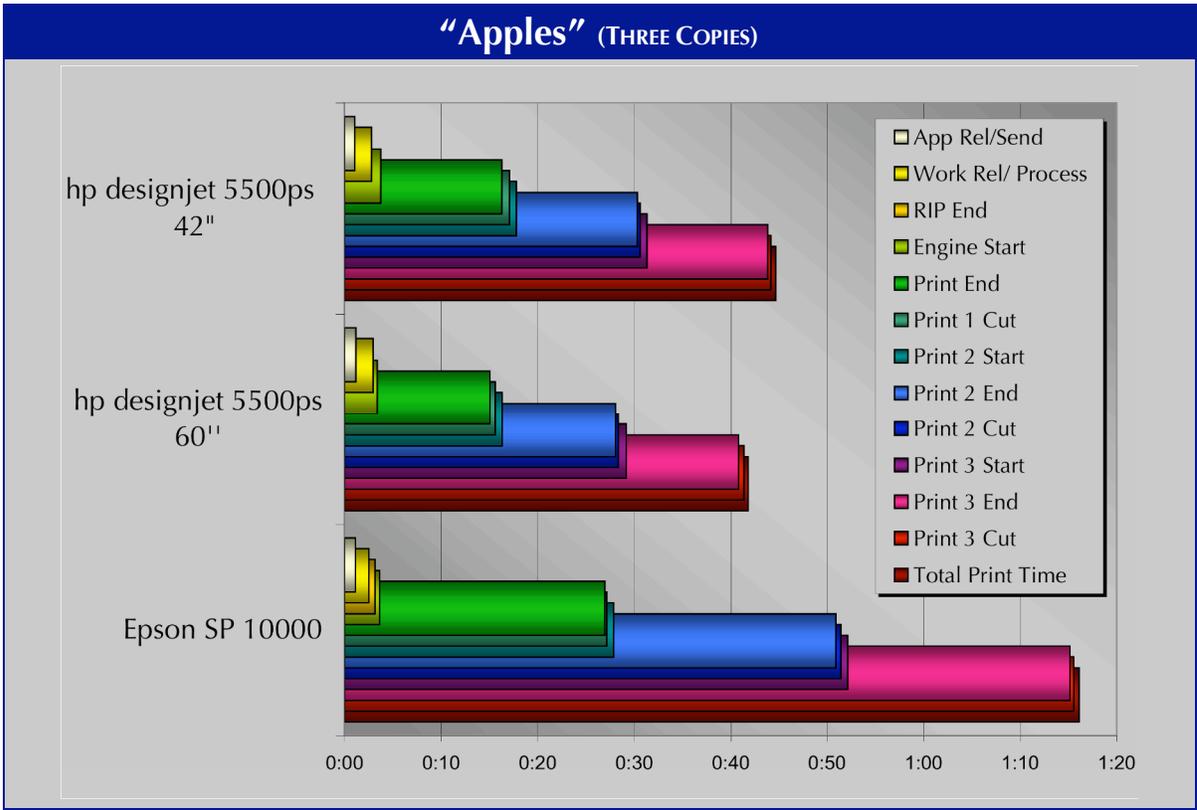
“Covered Bridge”

The *Covered Bridge* file on the 42" dj5500ps was more than 35% faster than the SP10000. Whereas the SP10000 took 12 minutes¹¹, the dj5500ps completed the job in 8:48. Printing on both the dj5500ps and SP10000 started quickly, within 2 to 3 minutes.

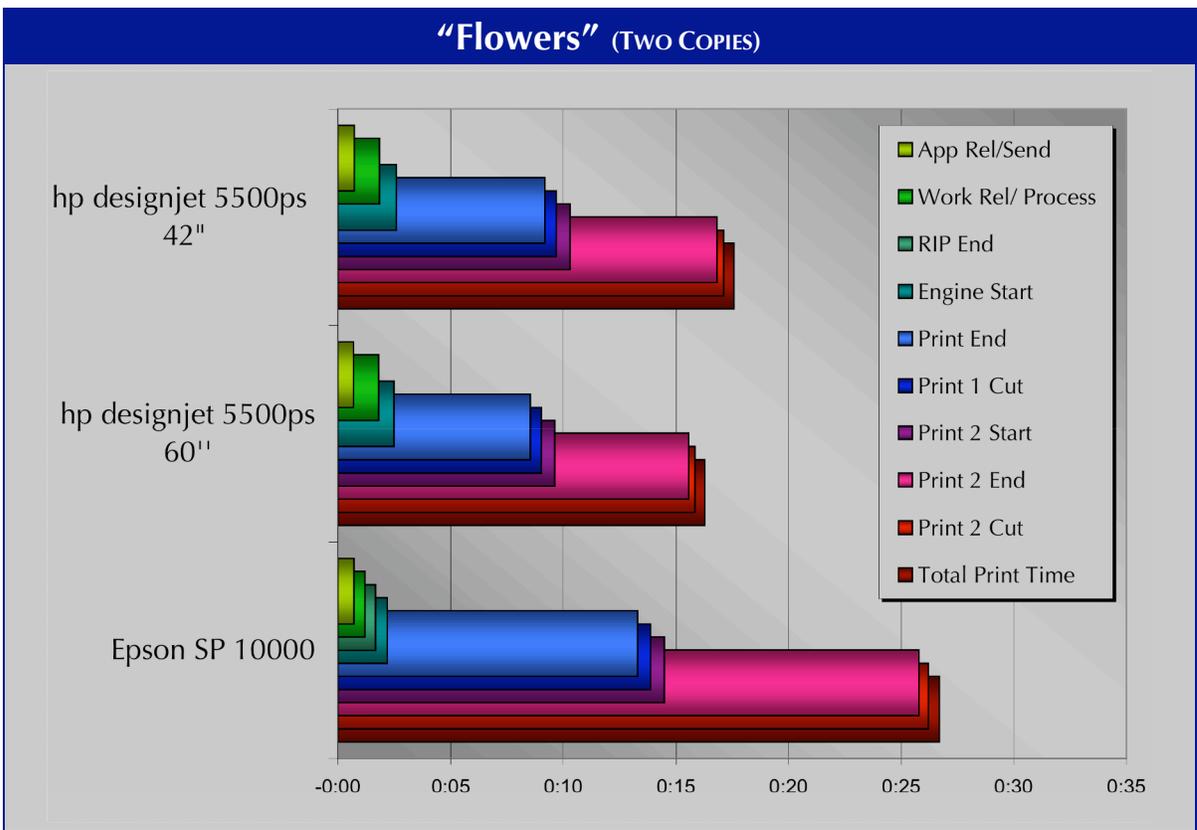


“Apples”

The 42" dj5500ps completed printing three copies of the *Apple* test document in 44:40, 70% faster than the SP10000 (1:16:06). The 60" dj5500ps model, able to print this size file in landscape orientation, was over 80% faster than the SP10000 at 41:48. A print advantage is seen on both of the dj5500 models, with the PRINT 1 CUT produced over ten minutes sooner than on the SP10000.



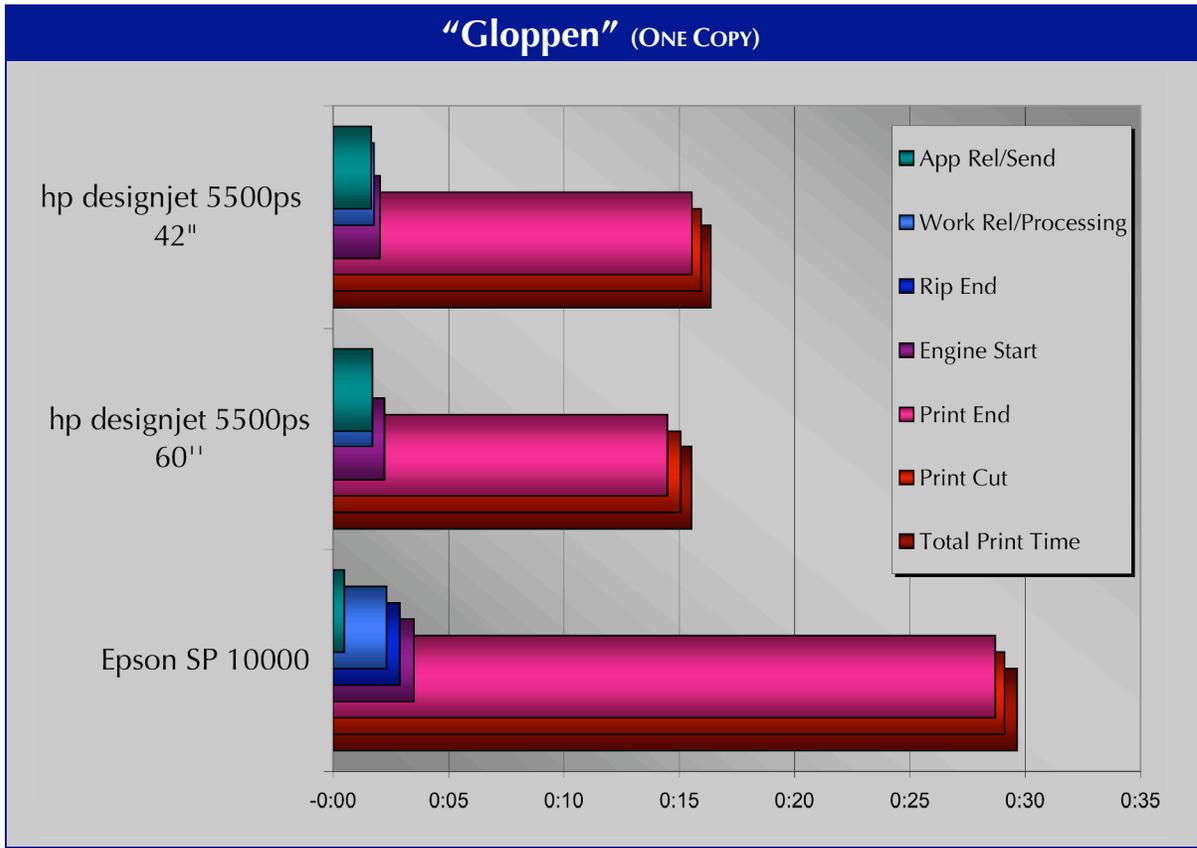
"Flowers"



Two copies of the *Flowers* file completed printing at 17:34 on the 42" dj5500ps, 52% faster than on the SP10000 (26:42) Able to print this size file in landscape orientation, the 60" dj5500ps model showed a 64% advantage (16:17) over the SP10000. Again a print advantage is seen on both of the dj5500 models, with the PRINT 1 CUT produced in two-thirds the time of the SP10000.

“Gloppen”

The 42" dj5500ps completed printing the *Gloppen* test document in 16:22, 80% faster than the SP10000 (29:39)¹². The 60" dj5500ps, able to print this size file in landscape orientation (without rotation), was over 90% faster (15:32) than the SP10000. As in all of the other test documents, the print advantage is seen on both dj5500ps models, with the PRINT CUT produced in half the time of the SP10000 (29:06).

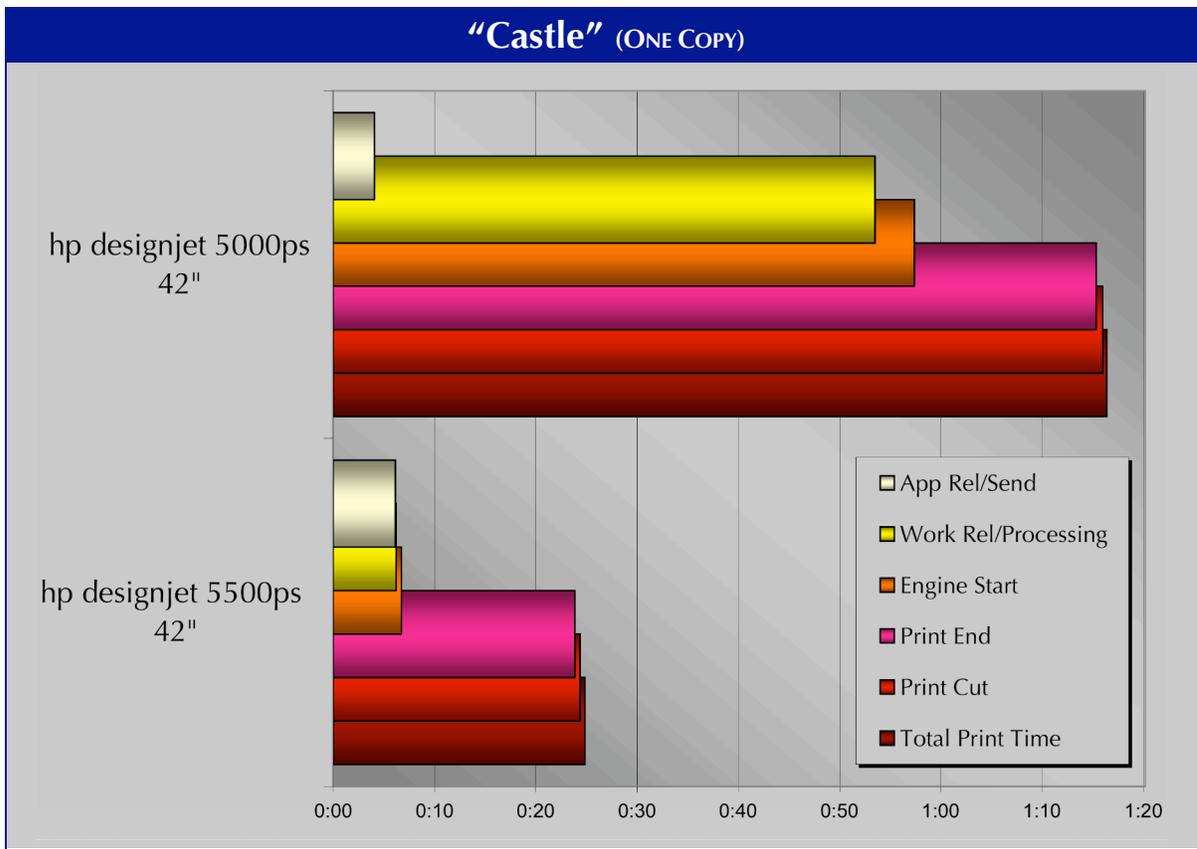


Comparison: Hewlett-Packard hp designjet 5500ps—hp designjet 5000ps

“Castle”

The 42" dj5500ps produced the *Castle* file more than three times faster than the dj5000ps. While the dj5500ps produced this file in 24:52, the dj5000ps took over an hour at 1:16:24.

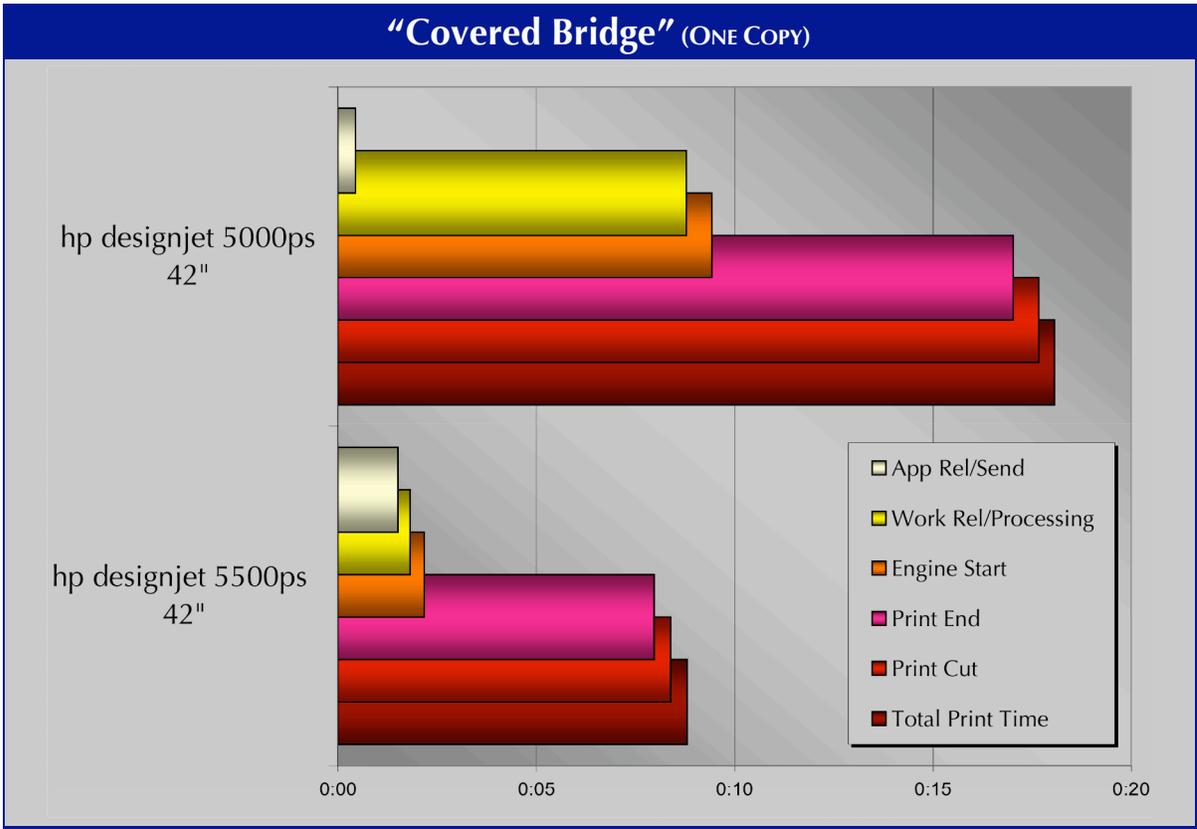
The MECHANICAL PRINT TIME was twice as quick on the dj5500ps as on the dj5000ps, and with a startling difference in the RIP time. The ENGINE START TIME of the dj5500ps was especially impressive over the dj5000ps, processing the image almost nine times faster and becoming the major measurable indicator of overall quicker printing.



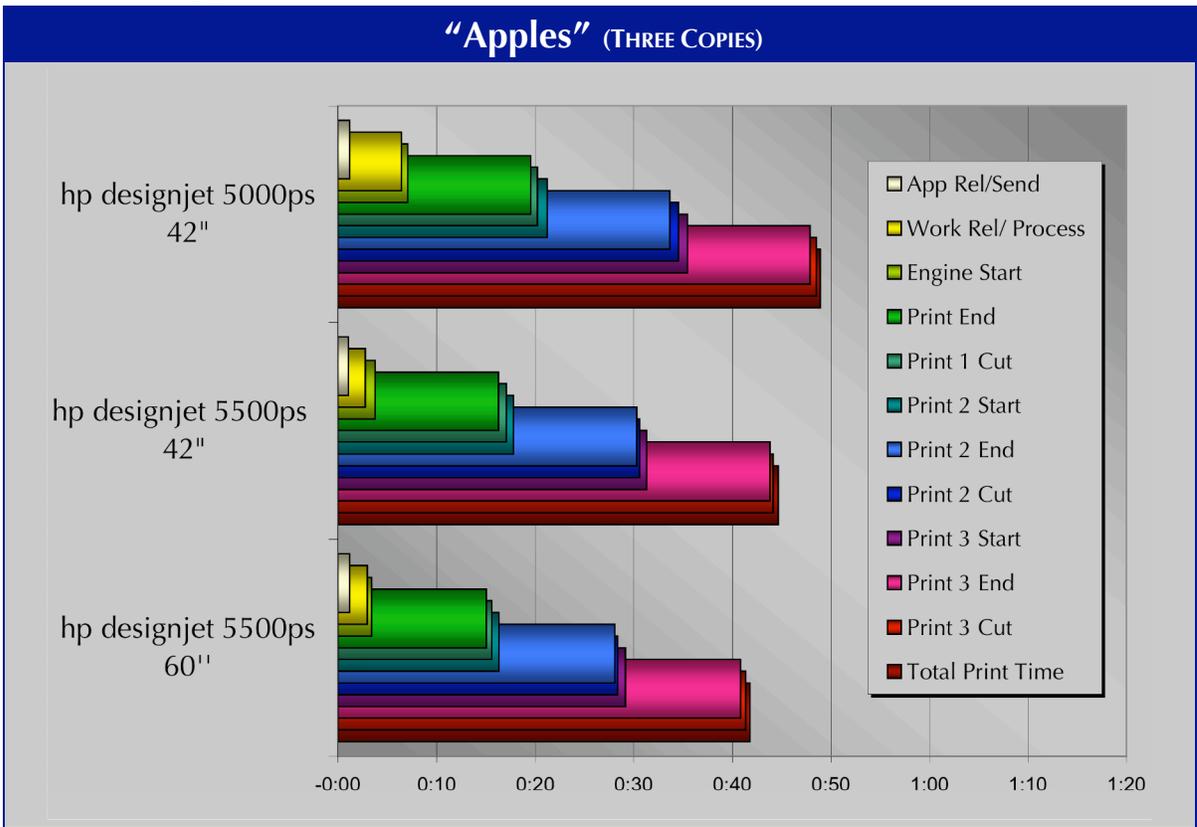
“Covered Bridge”

The *Covered Bridge* file on the 42" dj5500ps was more than twice as fast as on the dj5000ps. The dj5500ps completed the job in 8:48, whereas the dj5000ps took over 18 minutes to complete.

As previously seen on the *Castle* file, ENGINE START time of the dj5000ps at 9:26 accounted for the majority of the TOTAL PRINT TIME, while the dj5500ps starting printing in just over 2 minutes.



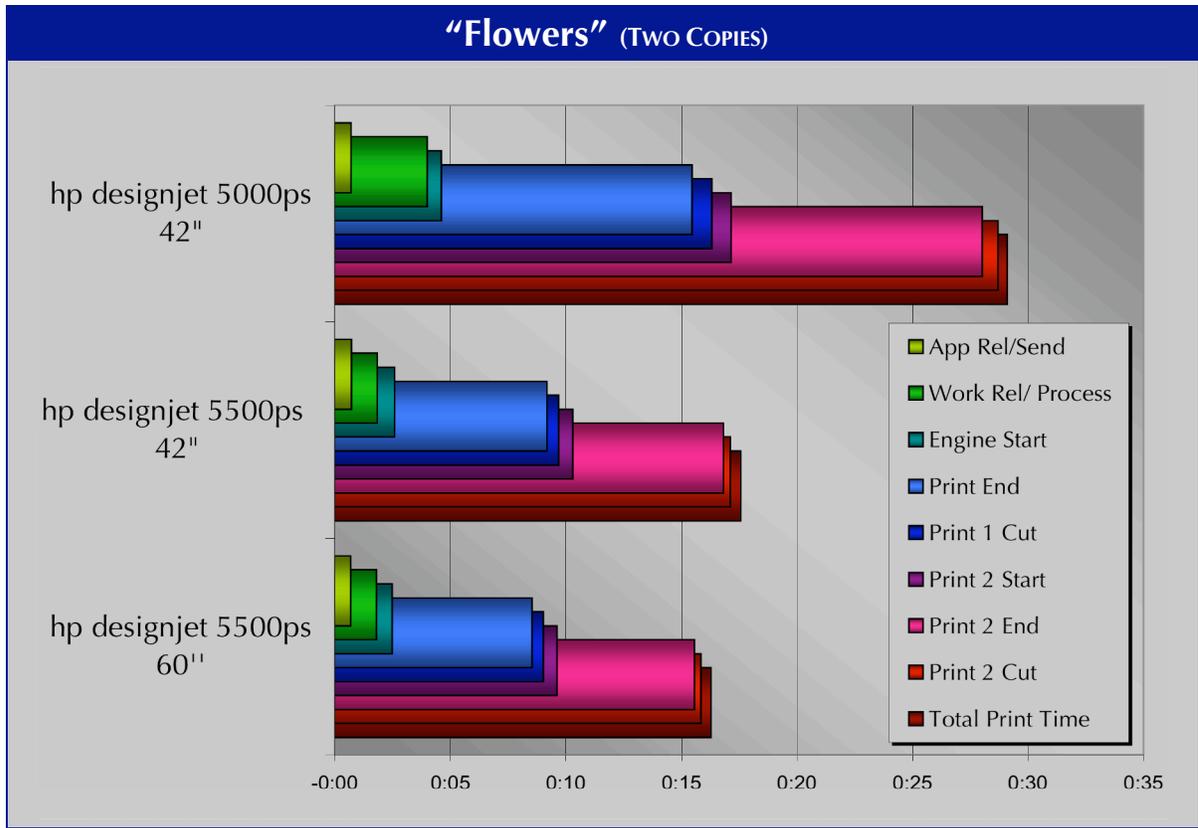
"Apples"



The 42" dj5500ps completed printing three copies of the *Apples* test document in 44:40, 10% faster than the dj5000ps (48:56). The 60" dj5500ps model, able to print this size file in landscape orientation, was over 15% faster.

A print advantage is seen on both of the dj5500 models, with the PRINT 1 CUT produced up to 5 minutes sooner than the dj5000ps.

“Flowers”

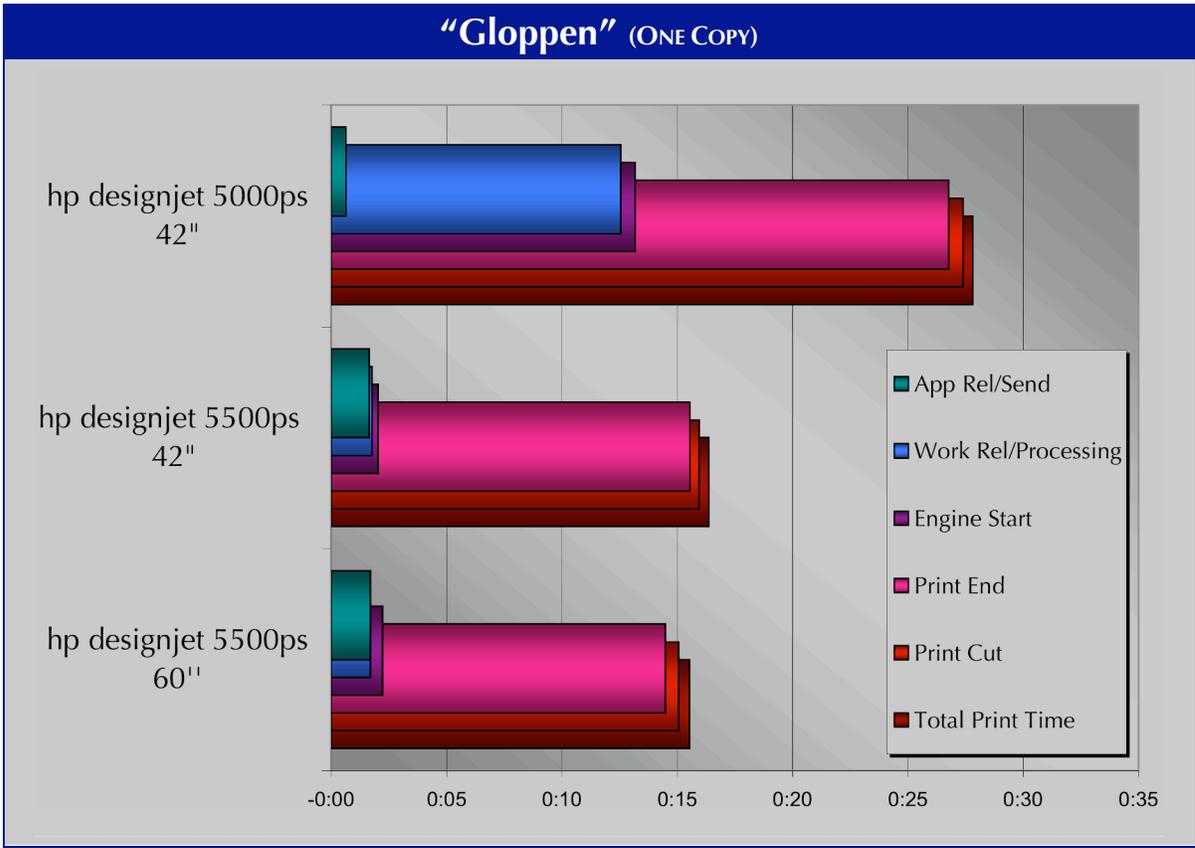


Two copies of the *Flowers* file completed printing at 17:34 on the 42"dj5500ps, 66% faster than the dj5000ps (29:07). Able to print this size file in landscape orientation, the 60" dj5500ps model showed a 79% advantage (16:17) over the dj5000ps.

Again a print advantage is seen on both of the dj5500 models, with the Print 1 cut produced in less than two-thirds the time of the dj5000ps.

“Gloppen”

The 42" dj5500ps completed printing the *Gloppen* test document in 16:22, 70% faster than the dj5000ps (27:49)¹³. The 60" dj5500ps, able to print this size file in landscape orientation (without rotation), was almost 80% faster (15:32) than the dj5000ps. As in all of the other test documents, the print advantage is seen on both dj5500ps models, with the PRINT CUT produced in almost half the time of the dj5000ps (27:24).



Collective File Suite

The chart below represents the suite of test documents used during the testing. The TOTAL PRINT TIME for each of the files has been added, in order to calculate a TOTAL SUITE PRINT TIME.

	Epson SP10000	42" hp dj5500ps	hp dj5000ps
<i>Castle</i> 1 copy	0:52:59	0:24:52	1:16:24
<i>Covered Bridge</i> 1 copy	11:59.8	0:08:48	18:04.3
<i>Apples</i> 3 copies	1:16:06	0:44:40	0:48:56
<i>Flowers</i> 2 copies	0:26:42	0:17:34	0:29:07
<i>Gloppen</i> 1 copy	0:29:39	0:16:22	0:27:49
Total Suite Print Time (8 printed copies)	3:17:25	1:52:16	3:20:20
Average Copies / Hour	2.43	4.28	2.40
Copies / 8-hour Day	19 +	34 +	19 +

From this figure, it can be calculated that during a continuous eight-hour workday of a Print Service Provider (media changes excluded), an Epson Stylus Pro 10000 could produce an average of 2.43 copies per hour while the 42" hp designjet 5500ps could produce almost twice as much: 4.28 copies/hour.

This translates into the ability of the new 42" 5500ps to produce more than 34 copies in 8 hours, compared to a little over 19 copies each for the SP10000 and the dj5000ps. Overall, the dj5500ps was an average of 176% faster than the SP10000 and 178% faster than the dj5000ps in this simulated workday.

Ease-of-Use

The hp dj5500ps provides the user with a simple method to send files to the printer. With no driver software to install, connection to the printer is direct utilizing Internet Explorer. During testing it was noted that WebSubmitter is unable to automatically rotate TIFF files; this bug was reported to hp.

The SP10000 installation of the RIP is routine; however for the printer setup, the user must search manually for the driver file. When printing an image whose width is larger than its height, the TRANSVERSE option must be chosen in the PS driver, or else the printer will print SHORT EDGE FIRST (even if width is less than 44 inches). Not documented, this problem was only resolved by calling Epson Tech Support. The SP10000 also offers Drop Folders, for sending a file directly to the RIP without opening the application. The user cannot see nor change the print settings, and the unknown defaults in the RIP are used. These defaults override most of the printer and document settings. The defaults themselves cannot be determined and with another phone call to Epson Tech Support it was recommended not to use the Drop Folders.

On the dj5000ps, driver installation and set-up was routine. Paper handling and maintenance, on all printers in the test, were straightforward.

About *spencerLAB*

The *SpencerLab* Digital Color Laboratory is an independent printer evaluation laboratory that provides services to vendors and corporations for whom color printing is mission-critical. The Laboratory follows strict guidelines in the integrity of both methodology and reporting; vendor-sponsored studies do not guarantee favorable results. *SpencerLab* has developed industry-standard test software, and performs print quality, throughput speed, cost-per-page and ink and toner cartridge yield, and ease-of-use analyses for color and monochrome printers in all technology classes, from inkjet and laser printers to digital color presses.

SpencerLab is operated by Spencer & Associates Publishing, Ltd., a premier information technology consulting boutique specializing in the application of Digital Color Technology to all aspects of color imaging. For over a dozen years Spencer & Associates has been providing strategic support to manufacturers in product planning, development, and launch. Color printing workflow analysis, print system selection, and usage optimization services are provided to corporate users.

For more information, please contact *SpencerLab* by email at info@SpencerLab.com, by telephone at 1-631-367-6655, by fax at 1-631-367-2878, or on the web at www.spencer.com and www.spencerlab.com.

¹ The 60" model of the hp designjet 5500ps was used in 42" as well as 60" tests; simulation of the 42" model adhered to appropriate media and related limitations.

² The *SpencerLab* Printer Test Suite, now in beta, is an extension of Spencer & Associates' *Color Hardcopy Quality Factors* test suite, a de facto industry standard since 1990.

³ Eight-hour timings were calculated from tested 'Total Print Time' and do not include media changes.

⁴ Application Release was measured on the Epson SP10000 and hp dj5000ps. Since files were sent directly to the dj5500ps through WebSubmitter, Send time was measured.

⁵ Workstation Release was measured on the Epson SP10000 and hp dj5000ps. Since files were sent directly to the dj5500ps through WebSubmitter, Processing time was measured.

⁶ Repeatability is within one percent ± 1 second.

⁷ Timing results would have been the same on the 60" model as the 42" model, due to the fact that the WebSubmitter did not support automatic file rotation at the time of testing.

⁸ Timing results would have been the same on the 60" as the 42" model due to Landscape orientation.

⁹ Times are denoted as hr:min:sec.tenths, min:sec.tenths, or sec.tenths; hr:min on graphs.

¹⁰ The opening of the file in Photoshop, necessary to send the file to the SP10000, increases the overall time to produce this file by two minutes.

¹¹ The opening of the file in Photoshop, necessary to send the file to the SP10000, increases the overall time to produce this file by eighteen seconds.

¹² The opening of the file in Photoshop, necessary to send the file to the SP10000, increases the overall time to produce this file by twenty-two seconds; however, rotation was performed automatically. On the 42" dj5500, the file needed to be opened, rotated and saved – taking 33 additional seconds.

¹³ On the 42" dj5500 and the dj5000 printers, the file needed to be opened, rotated and saved – taking 33 additional seconds.