

Dell 2330dn Laser Printer

33 PPM Laser Printer



Reliability.....	Excellent
Administrative Utilities.....	Very Good
Feedback to Workstations.....	Excellent
Ease of Network Setup.....	Very Good
Print Drivers.....	Very Good
Applications Compatibility.....	Excellent
Print Quality.....	Good
Productivity.....	Very Good
Ease of Use.....	Very Good
Feature Set.....	Good
Security Features.....	Not Rated
Environmental Features.....	Not Rated
Toner Yield.....	Good

PERFORMANCE SUMMARY

With a rated speed of 33 ppm, the Dell 2330dn Laser Printer gave an above average performance in its lab evaluation. The A4 desktop laser printer, which is simple to set up and use, demonstrated near-flawless reliability throughout its 25,000-impression durability test, with only one misfeed recorded. Dell has dramatically improved feedback to workstations from the previous version of Status Monitor Console by providing more detailed information in the utility and the types of alerts that users can configure. Additionally, the unit proved to be very productive and has a tested toner yield that exceeded the rated yield. Based on these findings, BLI highly recommends the 2330dn Laser Printer for offices with monthly print volumes of up to 2,000 impressions.

Test duration:

Two months, including a 25,000-impression durability test.

Maximum monthly duty cycle:

Up to 50,000 impressions.

Manufacturer's recommended monthly volume:

750 to 2,000 impressions.

BLI's recommended monthly volume for optimum performance:

Up to 2,000 impressions.

More information on the Dell 2330dn Laser Printer is available through bliQ (www.buyerslab.com/bliQ).

Strengths

- Highly reliable
- Very good overall halftone range and dark solids
- Highest overall efficiency in simplex mode; among the fastest first-print times for all test documents, including the fastest for the TIFF file; among the fastest first-print time out of energy-save mode
- Above average maximum paper capacity; standard automatic duplexing
- Print cartridges exceeded the rated yield; toner-save mode in the drivers
- The improved Status Monitor Console provides more detailed information in the utility and the types of alerts that users can configure
- Straightforward procedure for adjusting paper drawers; clean process for replacing cartridge
- Highly automated drivers installation routine

Weaknesses

- More than average stair-stepping of diagonal lines

PERFORMANCE OVERVIEW

+, – and ○ represent positive, negative and neutral attributes, respectively.



RELIABILITY

EXCELLENT

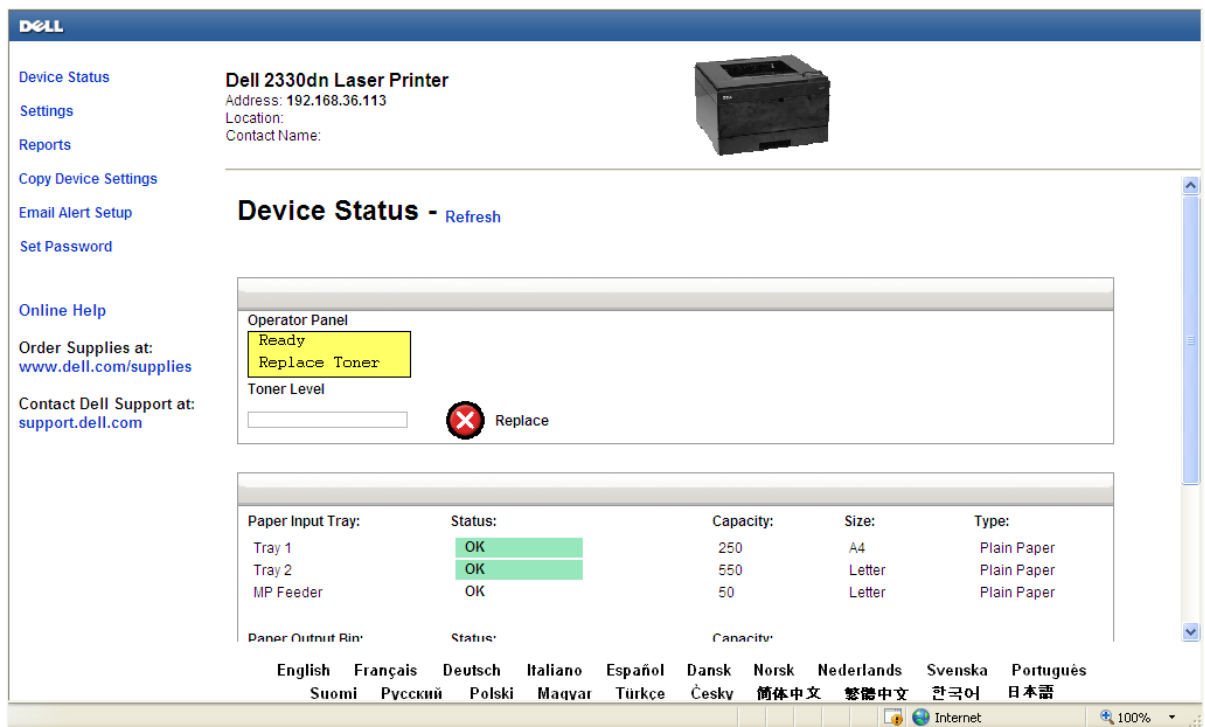
+ The 2330dn Laser Printer is certified highly reliable by BLI, completing a 25,000-impression durability test with only one misfeed. Moreover, it required no service of any kind.



ADMINISTRATIVE UTILITIES

VERY GOOD

- O Dell OpenManage Printer Manager allows administrators to remotely manage multiple Dell and compatible devices on the network via a Web browser. Though the fleet management utility provides great detail about Dell devices, its capabilities in terms of compatibles is more limited than with other competitive tools. OpenManage Printer Manager is available as a download on the company's Web site.
- + The embedded Web page, Dell Web Printer Configuration Tool, lets administrators configure the unit remotely on the network and monitor paper status—"Okay" or "Add Paper"—and remaining toner, as indicated in percent gauges.



Embedded Web Page—Device Status (U.S. model pictured)

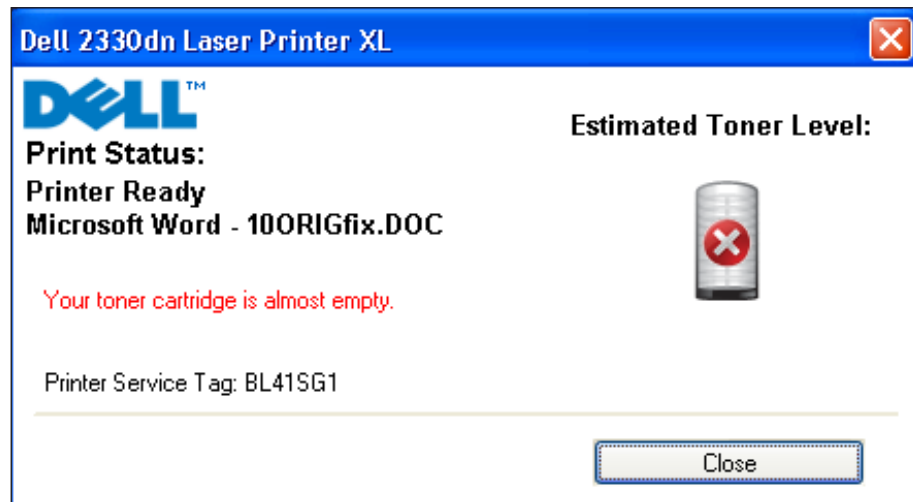
- + Status Monitor Console (SMC) is either resident or activated manually, displaying information for devices that have bi-directional support enabled. Administrators and users can proactively check SMC for status, names of print jobs, level of toner supply, guidance for reordering toner and the user's manual for troubleshooting details.



FEEDBACK TO WORKSTATIONS

EXCELLENT

- + SMC is installed simultaneously with the driver and allows for pop-up messages or icon alerts, which notify users of errors and warnings, to be configured. When a job is sent, the utility pops up so that users can see paper status—“Okay” or “Add Paper”—and remaining toner, as indicated in a percent gauge. It can also be proactively accessed.



Status Monitor Console—Printing Status Pop-Up Message (U.S. model pictured)

- O Users can enable the pop-ups to appear during printing or disable the functionality altogether.
- O Pop-ups for print job completion aren't available, but this is common among devices in this class.
- O Administrators can set up e-mail alerts so that key operators receive messages when consumables are depleted or an error has occurred.
- + Audible alerts are available and can be configured to beep when a job is complete or an error has occurred, among others.



EASE OF NETWORK SETUP

VERY GOOD

- O Physical setup is simple as the 2330dn Laser Printer stacks on top of the optional paper drawers, but note that Dell recommends at least two people lift the unit out of the box and place it in the desired location due to size and weight concerns. Users can then remove the packing tape and open the side cover to access the pre-loaded toner cartridges.

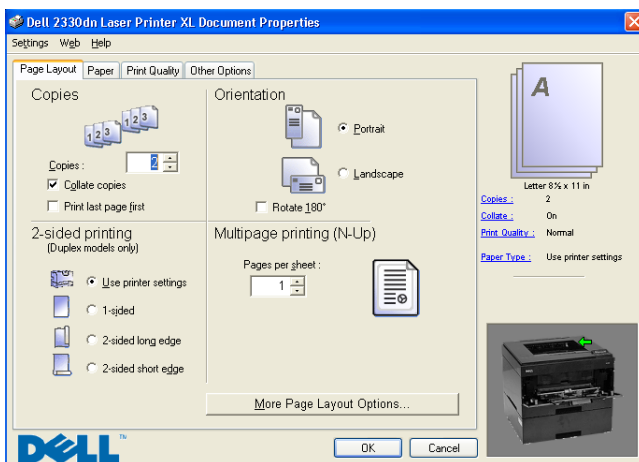
- + The CD launches upon insertion in the drive, and the automated installation routine will have users up and running in a matter of minutes. It takes seven clicks to simultaneously install the PCL and PostScript drivers, as well as included software, using the default routine; the port is automatically created, and the IP address is assigned using DHCP. Furthermore, the drivers automatically detect configured accessories.
- + Dell provides a utility whereby administrators can remotely install the drivers on workstations for uniform operation across the organization.
- O The CD contains the drivers, Dell Toner Management System and other support tools, as well as a user's manual in PDF format so that it can be printed.
- O OpenManage Printer Manager can be downloaded from Dell's Web site.



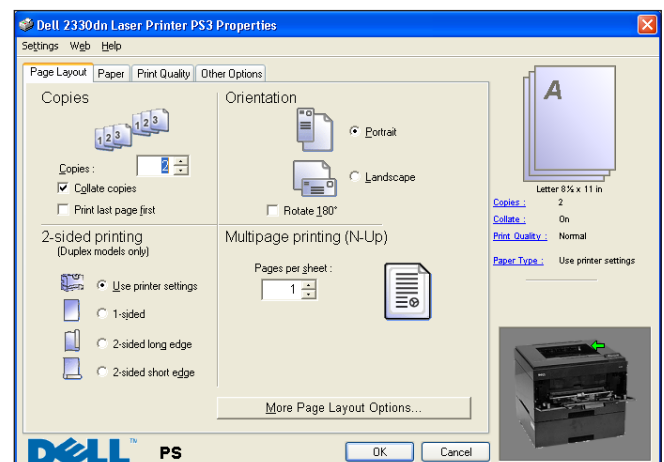
PRINT DRIVERS

VERY GOOD

- + The 2330dn Laser Printer ships with PCL 5e/6 and XL, and PostScript 3 drivers for various Windows and Mac operating systems, as well as environments that run Linux or UNIX. The drivers, which were tested on a Windows XP platform, were well laid out and easy to use.
- O The PCL driver is graphical and provides most of the selections for a typical job on the main screen. So too is the PostScript driver, which is atypical of this variety in that it's usually text-based. Still, the fact they're virtually identical helps boost ease of use in those environments where users frequently switch between them.



PCL XL Print Driver—Page Layout Tab (U.S. model pictured)



PostScript 3 Print Driver—Page Layout Tab (U.S. model pictured)

- The drivers, which have a good overall feature set compared to A4 monochrome laser/LED printers in this speed range and class, both include booklet and N-up—2 to 16—printing; quantity selection up to 999; and the abilities to save settings for frequently used jobs and to add watermarks. The PCL driver has auto reduction and enlargement, while the PostScript driver includes reduction and enlargement from 1 to 1,000 percent and mirror image.
- Although not uncommon, collate failed to work during testing when selected from the drivers. However, file size doesn't increase from one set printed using a 10-page document when producing multiple collated sets with collate selected from the print screen within the application.

**APPLICATIONS COMPATIBILITY****EXCELLENT**

- + No problems were experienced with any of the test files used in the applications compatibility tests. Units are tested for compatibility on a Windows 2000 platform with Microsoft Word 2000, PowerPoint 2000 and Excel 2000, as well as Adobe Page-Maker 7.0, Photoshop 6.0 and Acrobat 6.0, using 25 application test files that contain text, graphics, halftone images, tables, etc. that enable BLI technicians to evaluate memory usage, file processing, font rendering and greyscale capability.

**PRINT QUALITY****GOOD**

- + Text was rated Good, as darkness was above average and characters were fully formed, while sharpness and smoothness of curves and serifs were average. Line art was also good overall, as closely spaced fine lines didn't always remain distinct, consistency of line thickness was average and circles had some breakup, but diagonal lines displayed an above average amount of stair-stepping. Halftone pattern and range were rated Very Good and Good, respectively; greyscale was visible from the 1 to 99 percent dot-fill levels with distinct transitions between all levels, while coverage within levels had average smoothness but with minimal banding. Solids were excellent overall due to above average darkness and consistency of coverage.

**PRODUCTIVITY****VERY GOOD**

- The 2330dn Laser Printer's productivity using the PostScript and PCL drivers to print BLI's job stream, which replicates typical traffic in a multi-user environment, is competitive compared to A4 monochrome laser/LED printers in this speed range and class tested to date.

- The unit's productivity using the PCL driver to print multiple sets in simplex and duplex modes is competitive for the group. Note, however, that its simplex efficiency is the highest, at 91.8 percent of its rated speed.
- + The 2330dn Laser Printer's first-print times for all test documents are among the fastest in the group. Its first-print time for the TIFF file is the fastest.
- + The unit's first-print time out of energy-save mode is among the fastest in the group.



EASE OF USE

VERY GOOD

- The control panel features a 50.8 mm x 12.7 mm, two-line, 32-character LCD. There are six hard keys—Back, Menu, Enter, Cancel and left and right arrows—and one LED—Status.
- + The unit is easy to use from the desktop via the well-laid-out drivers.
- + Adjusting drawers for different size media is straightforward. Users simply press down on the blue tab for the length guide and slide it accordingly; the tab doesn't have to be removed and reinserted. Furthermore, the side guides move in sync and can easily be adjusted for paper that's narrower in width. As with most devices in this class, users must confirm the paper size via the control panel.
- Removing misfeeds from any of the three access locations is easy. Although users are prompted on the display that there's a misfeed, they aren't instructed how to remove it. The imaging drum might have to be removed to access a misfeed in that part of the unit.
- + Replacing the print cartridge is clean and straightforward: users press the button on the right side to open the front door, then simply pull out the old cartridge and insert the new one.



**Dell 2330dn Laser Printer Control Panel
(U.S. model pictured)**



FEATURE SET

GOOD

- While the 2330dn Laser Printer's standard memory capacity of 32 MB is below average compared to A4 monochrome laser/LED printers in this speed range and class, its maximum memory capacity of 288 MB is competitive.
- + The unit's standard and maximum paper capacities of 350 and 900 sheets, respectively, are competitive and above average for the group.
- The 2330dn Laser Printer's bypass tray capacity of 50 sheets is competitive for the group.
- The drawers and bypass support up to 90 and 160 gsm, respectively, both of which are competitive paper handling ability for the group.
- The unit's output capacity of 150 sheets is competitive for the group.
- + Automatic duplexing is standard.
- + Toner-save mode in the drivers helps to extend the life of the print cartridges.



SECURITY FEATURES

NOT RATED

Security Features	
Administrator password length (characters)	8-28 alphanumeric
AUTHENTICATION	
Network user authentication	Yes
Windows	Yes
Novell NetWare NDPS	Yes
LDAP authentication	No
802.1x wireless authentication	No
Kerberos protocol support	No
Authentication via department or user ID codes that are registered on the machine	No
Number of codes	Not applicable
Restrict usage of colour	Not applicable
Restrict usage of other features	Not applicable
Authenticated printing	Yes
Common Criteria Certification	No
Control panel lock/disablement	Yes
Digital user signature	Standard with S/MIME support
Encrypted PDF mode/encrypted scanning	No
Encrypted secure print	No
Hard drive encryption	Not applicable

Hard drive lock	Not applicable
Hard drive overwrite	Not applicable
Max number of overwrites after every job	Not applicable
Overwrite method	Not applicable
IP address filtering	Yes
IPsec	Yes
Job logs (e.g., activity monitoring, compliance auditing)	Yes
MAC address filtering	Yes
Password-protected mailboxes	Not applicable
Password-protected Web page	Yes
Port disablement	Yes
Removable hard drive	No
Secure print	Yes
Secure Sockets Layer (SSL)	Yes
SNMPv3 support	Yes
Third-party security features	Not applicable
Transport layer security	Yes
Unauthorised copy prevention (secure watermark)	Not applicable
USB block	Not applicable


ENVIRONMENTAL FEATURES
NOT RATED

Specified capable of running 30% post-consumer recycled paper	Yes
Specified capable of running 50% post-consumer recycled paper	Yes
Specified capable of running 100% post-consumer recycled paper	Yes
Instant/Quick Fusing	Yes
Duplexing	Yes
Toner-save mode	Yes
Energy-save mode/modes	Yes
Eco-Label Certifications	
Germany Blue Angel	Yes
ENERGY STAR	Yes
WEEE Directive compliant	Yes
RoHS compliant	Yes
Recycled materials/parts used in the product	No
Product designed for recycling (easily disassembled, no binding agents)	Yes
Hardware remanufacturing program for this product	Yes
Toner cartridge recycling program for this product	Yes
Pre-paid label for return of toner cartridges/bottles for this unit	Yes
Toner recycling system	Yes

Ability to program features such as duplexing and auto shut-off over entire fleet	Yes
Polyvinyl Chloride used in any aspect of the product or its packaging	No
Recyclable packaging materials for the product	Yes
Recyclable packaging materials for its consumables	Yes
Packaging materials used: No CFCs (chlorofluorocarbons), HCFCs (hydrofluorocarbons) or other ozone depleting substances; no halogenated plastics or polymers; complies with EU directive 94/62/EEC	
Tested energy consumption levels of the device (in watts):	
Power	13
Standby	13
During Printing	590
Emissions output from this device for the following substances (in mg/h):	
Ozone	Below quantifiable limits
Styrene	Below quantifiable limits
Benzene	Below quantifiable limits
TVOC	2.5
Dust	Below quantifiable limits



TONER YIELD

GOOD

- O The 2330dn Laser Printer's tested toner yield is competitive compared to A4 mono-chrome laser/LED printers in this speed range and class tested to date.
- + The average of the two tested print cartridges exceeded the rated yield by just over 1,100 impressions.

SUPPORTING TEST DATA

Test Environment

The product has been tested in BLI's 929-square-metre test lab, in an environment monitored by a Honeywell Temp/RH chart recorder, which replicates typical office conditions.

Test Equipment

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

Test Duration

Products are tested for two months, a portion of which consists of a durability test during which the product is run at half of its manufacturer-rated maximum monthly volume, with varying daily test volumes designed to replicate real-world use over an eight-hour workday. This variable schedule includes a mix of various-size documents, simplex and duplex modes, and a mix of short, moderate and long run lengths, and on/off cycles, throughout the day.

Tested Configuration

Dell 2330dn Laser Printer base model.

Test Procedures

The test methods and procedures employed by BLI in its lab testing include BLI's proprietary procedures and industry-standard test procedures, which include a BLI-developed variation of ASTM's 1318-90 Test Method for Determination of Productivity using Electrostatic Copy Machines. In addition to a number of proprietary test documents, BLI uses an industry-standard KATUN test original for evaluating black image quality and test suites from Quality Logic to evaluate applications compatibility. In addition to a visual observation under a Graphiclites D5000 Standard Viewer, colour print quality is tested using a colour test target, which is read using the X-Rite Eye-One/iO Colour Spectrophotometer, and samples are analysed using the CIE XY Chromaticity Diagram. In addition, density of black and colour output is measured using an X-Rite 500 Series Densitometer. Georgia-Pacific Spectrum Multi-Use Paper is used in the tests, 10 percent of which is recycled paper containing 30 percent post-consumer content. Image quality is tested using Georgia-Pacific Printing Paper.

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RELIABILITY

PMS/Malfunctions	Service Required	Meter Count (Impressions)	Impressions Between Service
Meter Count (Beginning of Test)		0	
End of Test Period		25,000	
Total Misfeeds/Misfeed Rate	1/Not applicable		
Total Service Calls	0		



ADMINISTRATIVE UTILITIES

VERY GOOD

Included Software:

Dell OpenManage Printer Manager allows administrators to remotely manage multiple Dell and compatible devices on the network via a Web browser. Though the fleet management utility provides great detail about Dell devices, its capabilities in terms of compatibles is more limited than with other competitive tools. OpenManage Printer Manager is available as a download on the company's Web site.

Status Monitor Console (SMC) is either resident or activated manually, displaying information for devices that have bi-directional support enabled. Administrators and users can proactively check SMC for status, names of the print jobs, level of toner supply, guidance for reordering toner and the user's manual for troubleshooting details.

SMC is installed simultaneously with the driver and allows for pop-up messages or icon alerts, which notify users of errors and warnings, to be configured. When a job is sent, the utility pops up so that users can see paper status—"Okay" or "Add Paper"—and remaining toner, as indicated in a percent gauge. Users can enable the pop-ups to appear during printing or disable the functionality altogether. SMC can also be proactively accessed.

The Printer Settings Report tab includes the Printer Information, Menu Settings, Reports, Network Settings, and TCP/IP Settings pages. The Printer Information page displays device information including the service tag number, printer serial number, printer type (colour or monochrome), asset tag number, memory capacity, processor speed, firmware version and print speed. The Menu Settings Page provides information on System Settings (time before the unit goes into power-saver mode; whether audible alerts are turned on for errors, print job completion or when the device is out of paper or toner; control panel language; and tray substitution for when the required paper size is not available); Paper Density (plain paper or labels); Auto Registration Adjustment; Altitude Adjustment; Non-Dell Toner; and Tray Settings (displays settings for paper size and type for each tray—including custom sizes—and whether a pop-up menu to set the paper size and type when paper is loaded is displayed at the control panel). The Reports page allows printing of printer settings, control panel settings, job history list, error history, and meter count, as well as a test page. TCP/IP Settings displays the IP Address, Subnet Mask and Gateway Address. The Printer Maintenance Tab allows users to change configuration settings for all of the settings displayed on the Menu Settings page.

Embedded Web page:

The embedded Web page, Dell Web Printer Configuration Tool, lets administrators configure the unit remotely on the network and monitor paper status—“Okay” or “Add Paper”—and remaining toner, as indicated in a percent gauge.

Consumables monitoring:

Yes, via SMC or the embedded Web page.

PRINT DRIVERS

Dell 2330dn Colour Laser Printer Print Driver Features

Features	PCL XL	PostScript 3
Auto Feature/Device Detection	Yes	Yes
Booklet Printing	Yes	Yes
Collate Sets	Yes*	Yes*
Max Paper Sources per Job	1	1
Mirror Image	No	Yes
Negative Image	No	No
N-up Printing	2 to 16	2 to 16
Overlays	No	No
Paper Gauge	No	No
Print and Hold	No	No
Proof Print	No	No
Quantity Selection	1 to 999	1 to 999
Reduction/Enlargement	Auto	1% to 1,000%
Resolution Modes	Best, Normal Draft: 600; 1200; 1200IQ; 2400IQ	Best, Normal Draft: 600; 1200; 1200IQ; 2400IQ
Save Settings	Yes	Yes
Secure Print	No	No
Watermarks/Custom Watermarks	Yes/Yes	Yes/Yes
Toner Save	Yes	Yes
Image Correction	Yes	Yes

*Although there's a collate selection in the driver, it didn't function in testing; collate must be selected from the Windows print screen within the application for output to be collated. This is common as most are written to allow the application settings to override the driver's.

Send once/print many:

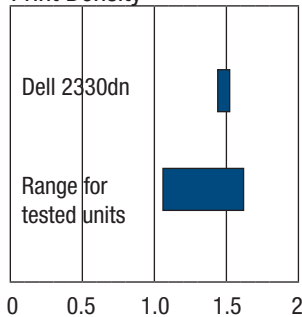
Yes. When collate is selected from the print screen within the application, file size remained the same. Output was properly collated.



PRINT QUALITY

Print Quality	
Text	Good
Line Art	Good
Halftone Range	Good
Halftone Fill	Very Good
Solids	Excellent

Print Density



Print Density

Dell 2330dn Laser Printer	Density for units in this class tested to date
1.41 to 1.50	1.15 to 1.54

Measurements are based on four readings corresponding to four different solid black locations on the output. The higher the density reading, the darker the image.

Halftone Range

	Visible halftone range
Dell 2330dn Laser Printer	1% to 99%
Typical range for competitive units	3% to 94%

The halftone test target contains blocks of increasing halftone dot-fill levels (1% to 100% in 1% increments).



PRINT/COPY PRODUCTIVITY

First-Print Time from Energy-Save Mode (Seconds)

Dell 2330dn Laser Printer	Average for units in this class tested to date
8.58	17.75

Device sits idle overnight; a single-page black Word document is sent to the device; first-print time indicates the time it took to RIP, image and deliver the first page of the test document to the output tray.

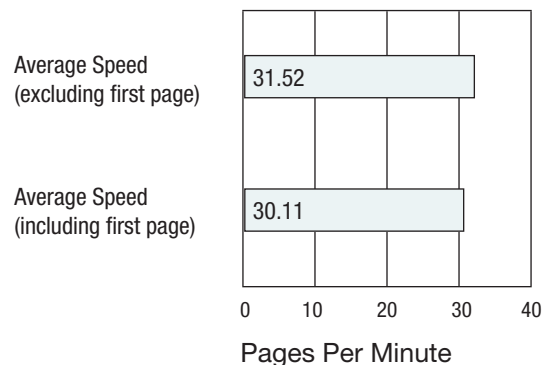
First-Print Times (Seconds)

Windows XP	Word	PowerPoint	Photoshop	Acrobat	Photoshop
File Type	Black Text	Colour Graphic/Text	Colour Graphic	Black Graphic/Text	Colour Graphic
File Extension	DOC	PPT	TIF	PDF	JPG
Pre-Raster File Size	114 KB	99 KB	20 MB	426 KB	245 KB
Post-Raster File Size	118 KB	171 KB	15.0 MB	1.93MB	809 KB
First-Page Time	7.79	9.22	13.91	12.12	8.75

First-print time indicates the time it took to RIP, image and deliver the first page of the test document set to the output tray. The unit's print speeds were tested at the default 600 dpi using the PCL XL driver.

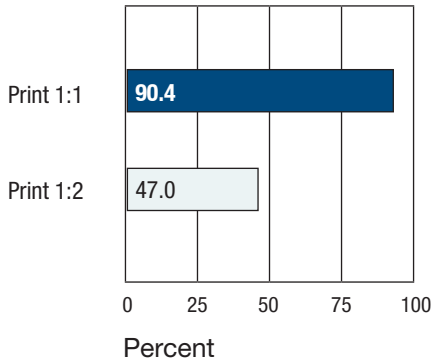
Dell 2330dn Laser Printer's rated speed:
33 ppm

BLI's Tested Print Speeds



Print speed is tested using BLI's Monochrome Test Original with 6% page coverage. The test page is printed in a quantity equal to double the vendor's rated print speed for the device in each mode tested (e.g., if the vendor's rated print speed is 20 ppm, 40 pages are printed). The unit's print speeds were tested at the default 600 dpi using the PCL XL driver.

Overall Efficiency



BLI obtains the overall efficiency percentage by dividing the tested speed of the device by the rated speed and then multiplying by 100 for each run length. All jobs are based on a 10-page document printed at the default 600 dpi using the PCL XL driver.

Black Print Efficiency for Multiple Sets

Sets	Time	PPM	Efficiency	Overall Efficiency
PRINT 1:1				
1	0:23.94	25.1	75.9%	75.9%
5	1:39.63	30.1	91.2%	83.6%
10	3:8.94	31.8	96.2%	87.8%
20	6:10.00	32.4	98.3%	90.4%
PRINT 1:2				
1	0:45.24	13.3	40.2%	40.2%
5	3:8.32	15.9	48.3%	44.3%
10	6:8.06	16.3	49.4%	46.0%
20	12:5.56	16.5	50.1%	47.0%

Efficiency is tested using a 10-page document in black mode. In print mode, the document is printed at the default 600 dpi using the PCL XL driver.

Job Stream

BLI's job stream includes Word documents, Outlook e-mail messages, Excel spreadsheets, PowerPoint, HTML and Acrobat PDF files, totalling 19 pages. This test simulates the type of traffic a typical device might experience in a real-world, multi-user environment. All of the files are sent to the printer as a group, at which time the stopwatch begins; timing ends when the last page of the last file exits the device. Job stream efficiency is determined by the percentage of the rated speed at which the unit operates when producing real-world jobs. The closer the rate is to 100%, or if it exceeds 100%, the more efficient the unit.

Job Stream in Black Mode:

The unit completed the job stream using the PostScript driver in 1 minutes 4.15 seconds, running at 17.8 ppm, which translates to an efficiency rate of 50.8%

The unit completed the job stream using the PCL driver in 48.84 seconds, running at 23.3 ppm, which translates to an efficiency rate of 70.7%.

Problems encountered:

None



TONER YIELD

Tested Toner Yield

Colour	Rated Toner Yield (Impressions)	Tested Toner Yield (Impressions)	Net Weight (Grams)	Impressions per Gram
Black	6,000	7,133	158.3	45.06

CERTIFICATE OF RELIABILITY

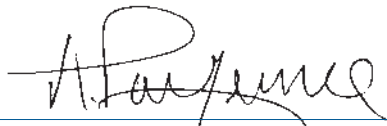
Awarded to

DELL INC.

for the performance of the

Dell 2330dn Laser Printer

in BLI's in-house durability test.



ANTHONY F. POLIFRONE
MANAGING DIRECTOR



FEBRUARY 2009

DATE

This is to certify that when subjected to a 25,000-impression Buyers Lab durability test in a networked environment, the Dell 2330dn Laser Printer proved to be a highly reliable product.

BUYERS LABORATORY INC.

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