EPSON AcuLaser C4000

EPSON

EPSON AcuLaser™ C4000

Sales Manual

Draft Version, February 2002

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1. Product concept and target

1-1 Product concept

Growth in sales of color laser printers is steady, and Epson is determined to attract new and replacement users by providing a solid range of products for every user need and budget. To date, products have provided excellent print quality, but speed has been relatively slow.

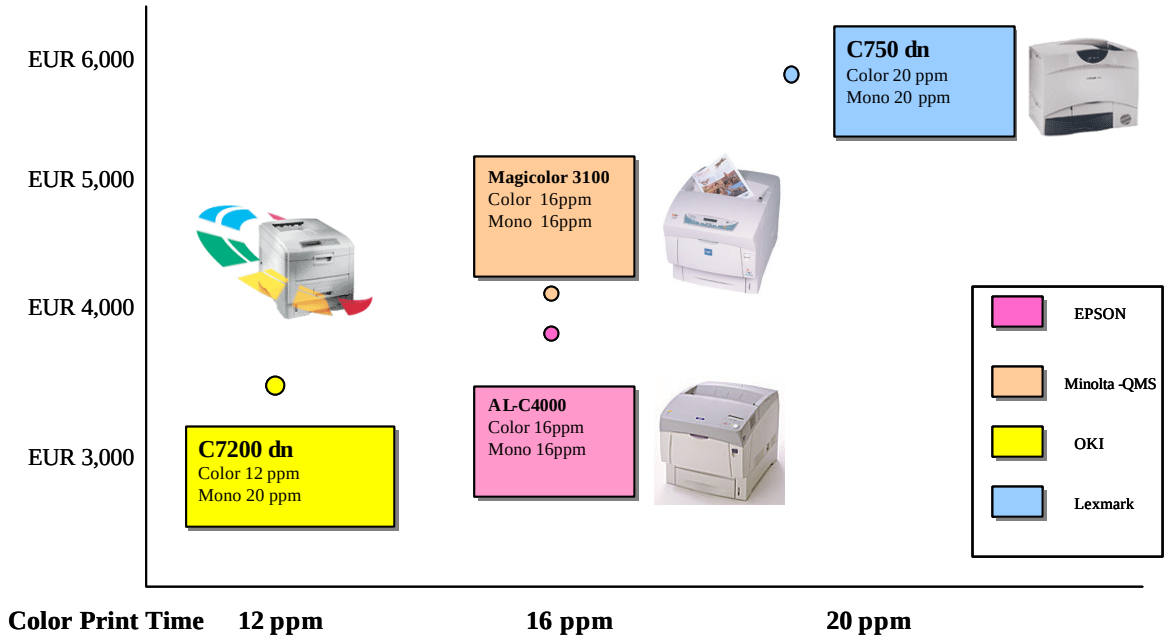
The Epson AcuLaser C4000 responds to this problem by providing high-speed – but without compromising on quality. Driven by a revolutionary tandem-type engine, this A4 color laser printer is set to become the flagship of the Epson color laser range. A wide range of superior features have the potential to open up color laser printing to heavy-duty users who to date have been using monochrome laser printers.

1-2 Target users

With its high-speed output, the AcuLaser C4000 is best suited to heavy users. Most of these users will be in large corporations, or smaller companies that have heavy-duty printing requirements. In addition, the superb quality of the prints means that it will also appeal to graphic users.

2. Positioning

This graph shows the positioning for the C4000 and its major competitors (Europe only).



3. Sales points

3-1 High-speed printing

The AcuLaser C4000 provides combines superb printing quality with high printing speed. Because of its ingenious tandem system, color and monochrome printing is performed at the same speed.

a. AcuLaser C4000 printing speeds (color and monochrome)

	Resolution	Simplex	Duplex	Transparencies and labels
AcuLaser C4000	**600 dpi**	**16 ppm**	**10 ppm**	**8 ppm**
	1200 dpi	**8 ppm**	**5 ppm**	**8 ppm**

b. Speed comparison with AcuLaser C2000

i. Single page color image printing

Time taken to print first page (single page color image printing)

	Monochrome	Color
AcuLaser C4000	15 secs.	15 secs.
AcuLaser C2000	16 secs.	25 secs.

ii. Multiple page color image printing

The AcuLaser C4000 is three to four times faster from the second page of multiple page printing of business documents (MS-Word/MS-Excel).

From the second page, the performance of the AcuLaser C4000 is dominant because of the engine performance.

* Detailed performance and competitive performance comparison data will appear in an updated version of this manual.

3-2 Print quality: True 1200 dpi support

The AcuLaser C4000 is a true 1200dpi high-resolution printer with Epson AcuLaser color 2400-dpi class print quality. Print quality is extremely high

Driver setting

- Fast mode: 300dpi with Epson AcuLaser color 1200-dpi class quality
- Fine mode: 600dpi with Epson AcuLaser color 2400-dpi class quality

(Fast mode is default)

True 1200-dpi support

If users want to print using true 1200 dpi, they must select the "Advanced Setting," and then select "1200dpi."

Comparison between 600 and 1200 dpi mode

	Quality comparison with 600 dpi	Performance comparison with 600 dpi
1200 dpi	Slightly improved	Much slower

In actual terms, printing quality at 1200 dpi is not significantly different from that at 600 dpi. However, the controller of the AcuLaser C4000 means that its 600 dpi printing is comparable in quality to the 1200 dpi of competitive printing. For these reasons, support of 1200 dpi should only be publicized for marketing communication purposes.

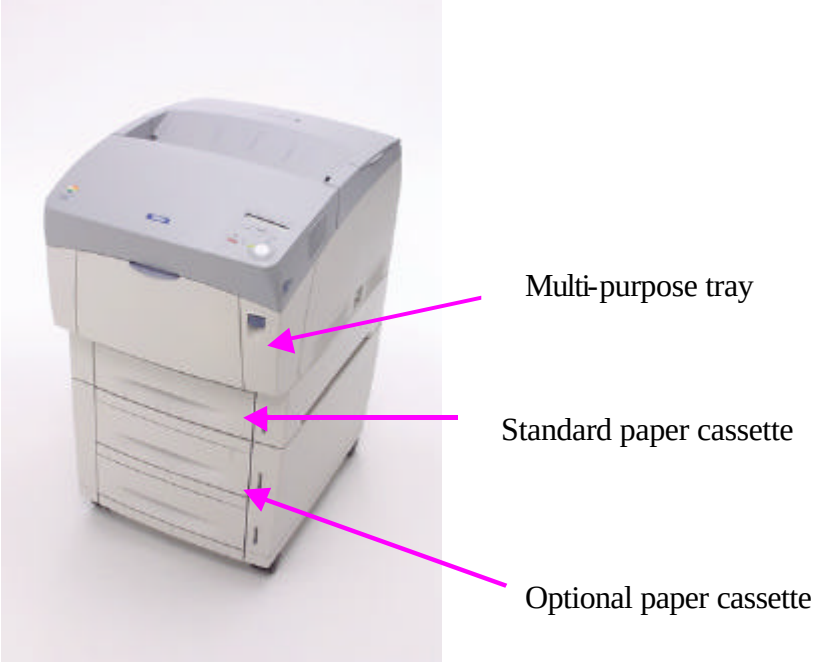
AcuLaser C4000 speed comparison (600 dpi vs. 1200 dpi)

3-3 Superb paper handling

a. Paper capacity

As can be expected from a fast printer like the AcuLaser C4000, it has an impressive paper capacity. Including the optional paper cassette, users can print up to 1,600 sheets without having to refill.

	Paper tray	Capacity
Standard	Paper cassette	500 sheets
	Multi-purpose tray	100 sheets
Option	Paper cassette	1000 sheets



b. Duplex printing

Unlike previous color laser printers where it has been an option, the duplex unit of the AcuLaser C4000 is built in and comes as standard. This is the first time for an Epson laser printer.

Note: Thick paper, transparencies, labels and envelopes cannot be printed using the duplex unit.

3-4 Short warm-up time and fast first print out

Thanks to the first “Quick Fuser” to be used in an Epson color laser printer, the warm up time for the AcuLaser C4000 is less than 30 seconds.

3-5 Easy to maintain

Even the most inexperienced of staff will be able to replace the toner and other consumables with the minimum of effort and training.

Unlike some laser printers, the AcuLaser C4000 allows users to replace toner cartridges without getting their hands dirty.

Simply lift out the toner you need to replace

3-6 Easy to upgrade

Using the slide-in controller board that is inserted into the rear of the AcuLaser C4000, users can upgrade the memory, PS DIMM, and the hard disk drive.

To access the controller board, simply undo the knobs on the back of the printer, and slide the board out.

3-7 Job management

The optional hard disk drive (HDD) provides users with a number of job management functions.

a. Job reprint

This function allows users to store a job on the printer's HDD and reprint it directly from the control panel at any time without using a PC. Data can also be deleted from the HDD directly from the control panel.
Possible applications:

b. Job verification

Using this function, users can print one copy of a job to verify the content before printing multiple copies. This is especially useful for users who are printing large or complex jobs. One the first copy has been verified, it is possible to print out or delete the remaining copies via the printer's control panel.

c. Job storage

With this function, users can store a job on the HDD of the printer, making it unnecessary for them to use up disk space on their PC. This is especially useful for storing frequently printed documents such as invoices. Data remains on the printer's HDD even after the printer is switched off or reset using the Reset All function.

d. Confidential job printing

This function allows users to set a four-digit password. The job will only be printed when the user types the password into the control panel.

e. HDD form overlay

Users can use this function to print faster by saving overlay data on the HDD of the printer rather than that of the PC.

i. Parameters

- Maximum number of files that can be registered is 200
- Language: ESC/Page-color only (no ESC/Page, PS etc)This feature is only available with Windows.When the paper size, resolution or paper feed directions are different

from the registered form and the selected documents, an error will occur.

ii. Registering a form on the HDD

1. Make a form on a PC using the printer driver.

Forms made on one PC cannot be transferred to another.

2. Register the form on the printer's HDD using the printer driver.

Only systems administrators can register a form using Windows NT or Windows 2000, and Windows 95 and 98 users cannot use this function.

iii. How to use a form contained in the HDD

1. Print the "Form Overlay List" using the front panel or the Print List on the printer driver
2. Confirm the file name
3. Enter the confirmed form file name into the printer driver.

This applies to Windows 95, 98, NT4.0 and 2000 users.

iv. How to delete a form from the HDD

1. Select "Delete Selected" from "Delete from HDD" in the printer driver.
2. Enter the name of the file you wish to delete in "Form Name," and press the Delete button. You can also select "Delete All," and click on the Delete button to delete all the forms on the HDD.

Only systems administrators can delete a form using Windows NT and 2000.

3-8 Interfaces

The following interfaces are provided as standard:

- IEEE 1284
- Ethernet 10/100 Base TX
- USB 1.1 *

* The AcuLaser C4000 is compatible with USB 2.0 FS, but the hardware is not compatible with USB 2.0 HS.

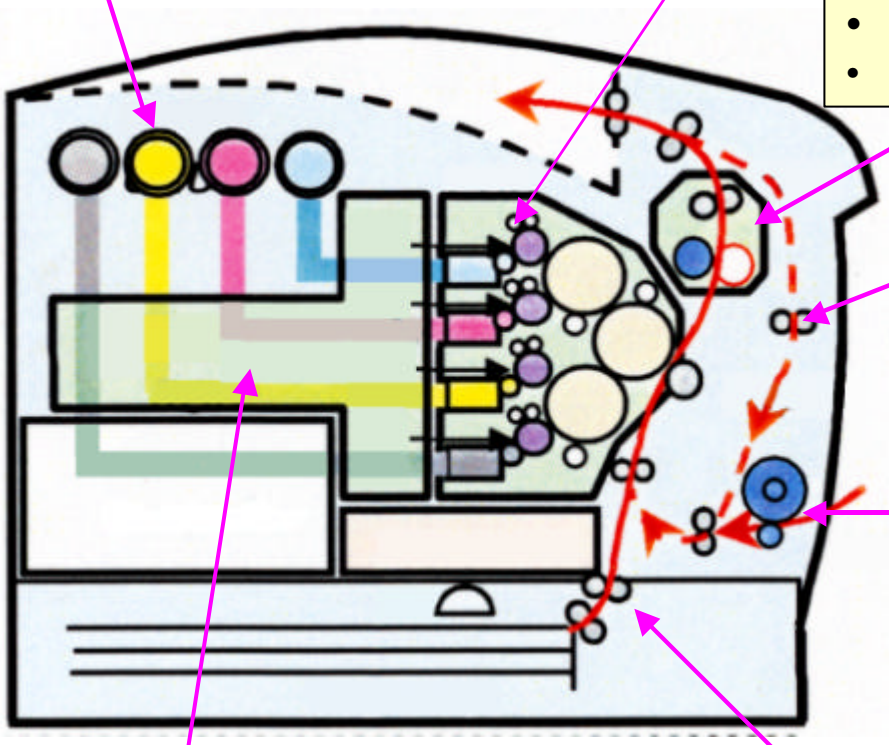
4. Engine structure

4-1 Epson AcuLaser C4000 engine structure

Photoconductor unit
- Unique 4-2-1 processing unit
  Compact, precise all-in-one system to achieve high quality images
- Easy maintenance

Toner cartridges
- New oil-less toner
- Separate cartridges for each color
- Easy maintenance

Fuser unit
- Epson's first "Quick Fuser"
- 30-sec. warm-up time



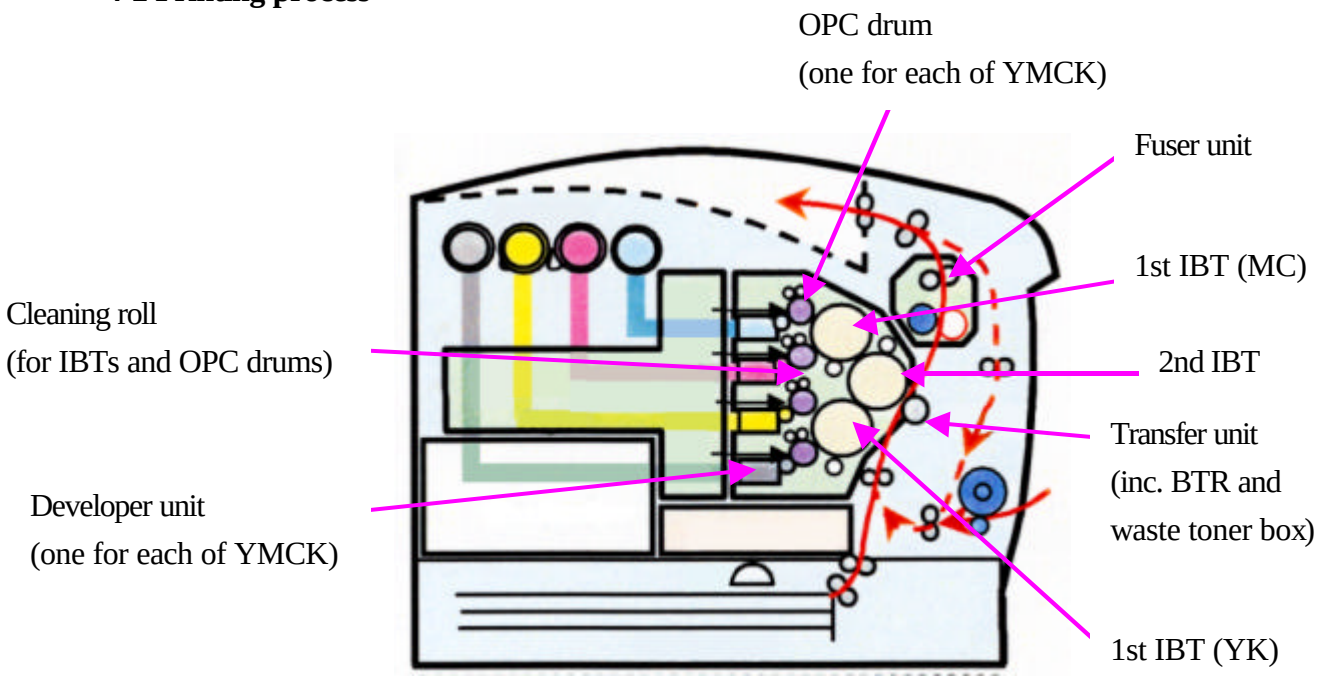
Duplex
- Standard built-in duplex

Multi-purpose tray
- Compatible with various paper types and thicknesses
- Transparencies, labels and envelopes OK

Lower cassette
- Reliable feed system with low jam rate

Laser unit
- Compact, precise and low cost all-in-one unit

4-2 Printing process



The AcuLaser C4000 printing process is as follows:

a. A 4-beam laser diode causes the image to be exposed simultaneously to each organic photoconductor (OPC) drum (one for each of YMCK).

b. Each color is simultaneously developed by its developer unit (one for each of YMCK).

c. MC and YK images are transferred to the relevant first intermediate bias transfer (IBT) (one each for MC and YK).

d. The images on the two 1st IBTs are transferred to the 2nd IBT, where they are combined.

e. The full color image on the 2nd IBT is transferred to the paper using the bias transfer roll (BTR), which is located inside the transfer unit.
The image is fused to the paper by the fuser unit, and the paper is discharged.

f. The three IBTs and the four OPC drums are cleaned by the cleaning rolls.

g. After the job has finished, the waste toner from inside each cleaning roll is collected in the waste toner box that is part of the transfer unit.

h. New toner is supplied from the toner cartridges.

5. Comparison with competitors

5-1 Minolta-QMS magicolor 3100

Advantages of AcuLaser C4000

- Quicker CPU
- Greater memory expandability

Minolta-QMS magicolor 3100

a. Minolta-QMS magicolor 3100 vs. Epson AcuLaser C4000

Specification	Epson AcuLaser C4000	QMS Magicolor 3100
Resolution	True 1200dpi	1200 x 1200 dpi
Printing speed	Color 16 ppm, black 16 ppm	Color 16ppm, black 16 ppm (simplex)
CPU	PowerPC 750CX 400MHz	QED 7065a R5000 RISC processor 350 MHz
Memory	64MB (expandable to 1024 MB)	256 MB (expandable to 384 MB)
Paper capacity	Standard paper cassette: 500 Multi-purpose tray: 100 Large capacity paper unit (option): 1000	Standard paper cassette: 500 Multi-purpose tray: 100 High-capacity input feeder (option): 1000
Duplex printing	Standard	Standard, automatic
Interface	IEEE1248 Bi-directional parallel, USB, Ethernet 10/100 base Tx	IEEE1248 Bi-directional parallel, USB, Ethernet 10/100 base Tx
Acoustic noise	Less than 52 db (A)	Less than 55 db (A)
Weight	34.5 kg (including consumables)	34.9 kg (including consumables)

b. Minolta-QMS magicolor 3100 detailed specification

Specification	Minolta QMS Magicolor 3100
Resolution	1200 x 1200 dpi
Printing speed	Color 16 ppm, monochrome 16 ppm (simplex)
	Color 8 ppm, monochrome 8 ppm (duplex)
CPU	QED 7065a R5000 RISC processor 350 MHz
Font	137 resident PostScript font, 40 HP-GL fonts, 76 PCL fonts, Kanji font options

Standard paper cassette	Capacity: 500 sheets
	Paper size: A4, LT, Legal, Executive, A5, B5 (JIS), Folio
Multi-purpose tray	Capacity: 100 sheet
	Paper size: A4, LT, Legal, Executive, Statement, A5, B5 (JIS), B5 (ISO), Folio, Com 10, Monarch, C5, C6
High-capacity input feeder (option)	Capacity: 1000 sheets
	Paper size: A4, LT, Legal, Executive, A5, B5 (JIS), Folio
Paper eject/capacity	Face down (maximum 250 sheets)
Duplex printing	Standard, automatic
Printer control language	Standard: PostScript 3, PCL6, PDF, HP-GL, Line printer
	Option: CGM, LN03 Plus, ImageServer, PostScript Level 2/CCITT, high-performance Group 3 and 4
Interface standard	CrownNet for Ethernet (10 Base T/100 Base Tx)
	IEEE1284 bi-directional parallel interface
	Universal Serial Bus
Interface option	CrownNet for Token-Ring (STP and UTP), CrownNet for Ethernet (10 Base T/100 Base Tx), DECnet-TCP/IP, SCSI (for connection of an external hard drive)
	IBM Interfaces: Ethernet, Token-Ring, Coax, or Twinax for IBM IPDS, Coax or Twinax for non-IPDS (SCS)
Memory	256 MB (expandable to 384MB)
First print time	17 seconds from idle
Acoustic noise	Stand by: less than 35db (A)
	During operation: less than 55db (A)
Durability	300,000 pages
Environmental conditions (operating)	Temperature: 5 to 32°C (41 to 89.6 °F)
	Humidity: 15 to 85% RH
Power requirements	Power supply/frequency: 100/120V models: 90-140 VAC ± 3% 220/240V models: 198-264 VAC ± 3%
Power consumption	Maximum: 850W
Dimensions	439 (W) × 638 (D) × 445 (H)
Weight	34.9kg (including consumables)
Consumable	Monocomponent toner cartridge Black: life span 8500 pages Yellow: life span 6000 pages Magenta: life span 6000 pages Cyan: life span 6000 pages
	Transfer unit: life span 25000 pages
	Imaging unit
	Fuser unit: life span 100000 pages

5-2 Oki C7200N

Advantages of AcuLaser C4000

- Higher resolution
- Network capability standard
- Greater memory expandability
- Faster color printing

Oki C7200

a. Oki C7200N vs. Epson AcuLaser C4000

Specification	Epson AcuLaser C4000	Oki C7200
Resolution	True 1200dpi	600 x 1200 dpi
Printing speed	Color 16ppm, black 16ppm	Color 12ppm, black 20ppm
CPU	PowerPC 750CX 400MHz	PWR PC 750/ 400MHz
Memory	64 MB (expandable to 1024MB)	64 MB (expandable to 512MB)
Paper capacity	Standard paper cassette: 500 Multi-purpose tray: 100 Large capacity paper unit (option): 1000	Standard paper cassette: 530 Large capacity paper unit (option): 1060
Duplex printing	Standard	Option
Interface	IEEE1248 Bi-directional parallel, USB, Ethernet 10/100 base Tx	IEEE1248 Bi-directional parallel, USB
Acoustic noise	Less than 52db (A)	Less than 54db (A)
Weight	34.5kg (including consumables)	47.6kg

b. Oki C7200N detailed specification

Specification	Oki C7200n
Resolution	600 x 1200 dpi
Printing speed	Color 12 ppm / monochrome 20 ppm
CPU	PWR PC 750/ 400MHz
Font	Adobe True Type, 10 True Type, 80 Microtype, 1 Bitmap, 1 bar code, 2 OCR
Standard paper cassette	530 sheets
	Paper size: letter, legal
Large capacity paper unit (option)	1060 sheets (530-sheet cassette x 2)
	Paper size: letter, legal

Paper output capacity	Maximum 500 sheets
Duplex printing	Option
Printer control language	Adobe PostScript 3, PCL5c
Interface standard	IEEE1284
	Universal Serial Bus (USB)
	Ethernet 10/100 base Tx
Memory	64MB (expandable to 512 MB)
Acoustic noise	During operation: less than 54 db (A)
Dimensions	429 (W) × 619 (D) × 429 (H)
Weight	47.6 kg
Printer driver/utility	Printer Driver for: Microsoft® Windows® 95/98/ME/2000/, Windows NT™ version 4.0, Mac™ OS

5-3 Lexmark C750

Advantages of AcuLaser C4000

- Quicker CPU
- Network compatibility standard
- Duplex standard
- Greater memory expandability

Lexmark C750

a. Lexmark C750 vs. Epson AcuLaser C4000

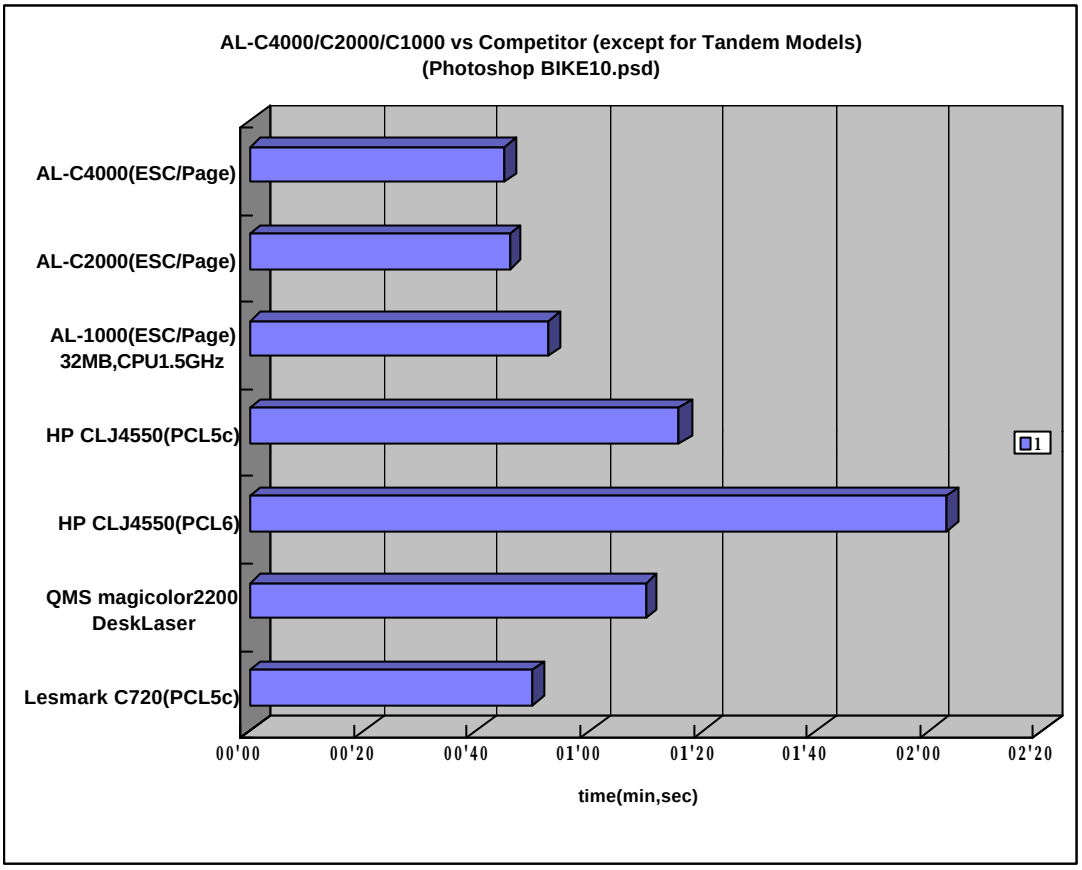
Specification	Epson AcuLaser C4000	Lexmark C750
Resolution	True 1200dpi	1200 x 1200 dpi
Printing speed	Color 16 ppm, black 16 ppm	Color 19 ppm, black 19 ppm (A4)
CPU	PowerPC 750CX 400MHz	350 MHz
Memory	64 MB (expandable to 1024MB)	64 MB (expandable to 512MB)
Paper capacity	Standard paper cassette: 500 Multi-purpose tray: 100 Large capacity paper unit (option): 1000	Standard paper cassette: 500 Multi-purpose tray: 100 High-capacity input feeder (option): 2000
Duplex printing	Standard	Option
Interface	IEEE1248 Bi-directional parallel, USB, Ethernet 10/100 base Tx	Centronics Bi-directional parallel, USB
Acoustic noise	Less than 52db (A)	Less than 51db (A)
Weight	34.5 kg (including consumables)	47.7 kg (including consumables)

b. Lexmark C750 detailed specification

Specification	Lexmark C750
Resolution	Black 1200 x 1200dpi, color 1200 x 1200dpi
Printing speed	Black 20ppm, color 20ppm (letter)
	Black 19ppm, color 19ppm (A4)
CPU	350 MHz
Font	156 scalable PostScript, 84 scalable PCL, 83 symbol sets in PCL 6 emulation, 2 PCL bitmap fonts
Standard paper handling	500 sheet tray
	100 sheet multi-purpose tray
	250 sheet output bin
Optional paper handling	500 sheet drawer
	2000 sheet drawer
	5 bin mailbox

Paper size	A4, Executive, Legal, Letter, A5, JIS-B5, Universal, 7 3/4, 10, DL, C5, 9, Folio, Statement
Paper output capacity	Standard: 250 sheets, maximum 3900 sheets
Duplex printing	Option
Printer control language	Standard: PCL 6 emulation, Postscript 3 emulation
Interface standard	Centronics Bidirectional Parallel
	Universal Serial Bus (USB)
Memory	64MB (expandable to 512MB)
First print time	Black: less than 17.5 seconds Color: less than 20 seconds
Acoustic noise	Stand by: 42db (A)
	During operation: 51db (A)
Dimensions	604.4 (W) × 470.9 (D) × 527.6 (H)
Weight	47.7 kg
Printer driver/utility	Printer Driver for: IBM AS/400, Linux 6.0 or later, Novell NetWare 3.x, 4.x, 5.x, Microsoft® Windows® 95/98/ME/ 2000/XP, Windows NT™ version 4.0, Mac™ OS 8.6 or later
Consumable	Toner cartridge High yield: life span 15,000 pages (CMYK) Standard: life span 6,000 (CMYK)

5-4 Competitive performance comparisons



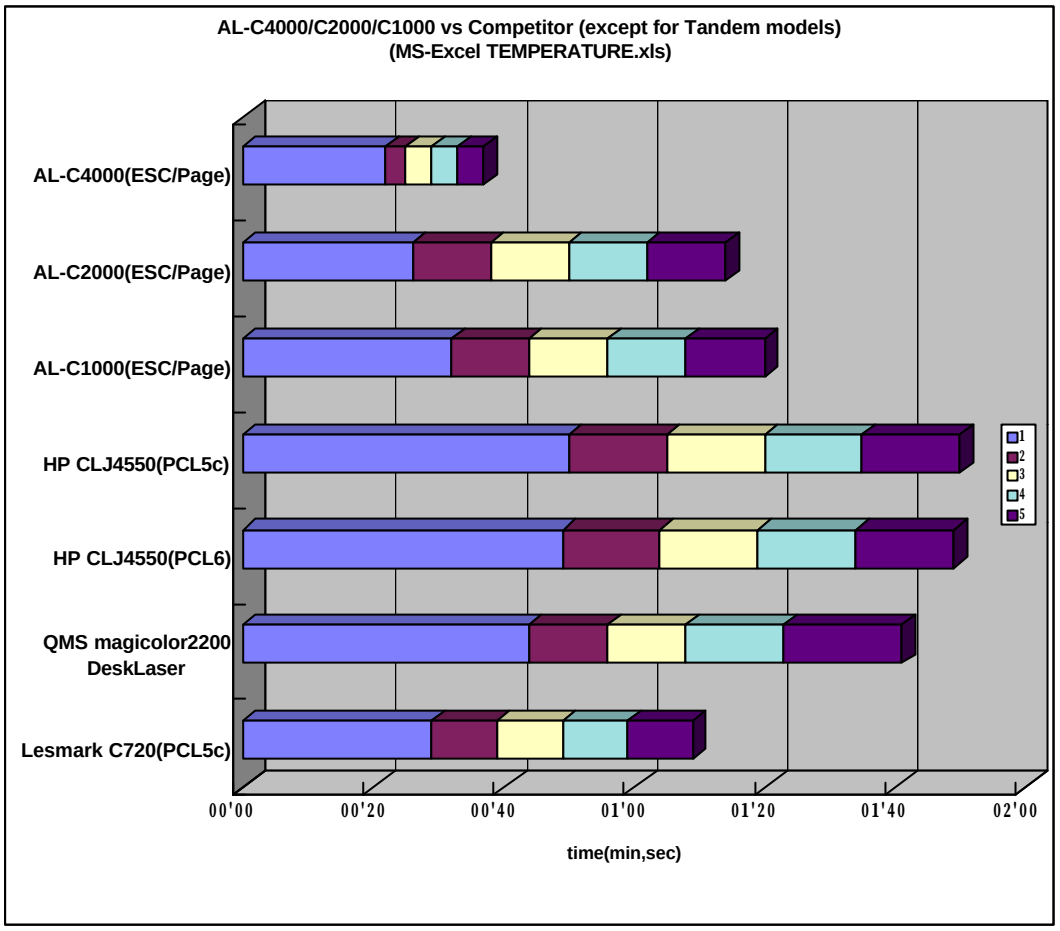
Performance of AcuLaser C4000 vs. C1000, C2000 and competitive printers (Photoshop Bike)

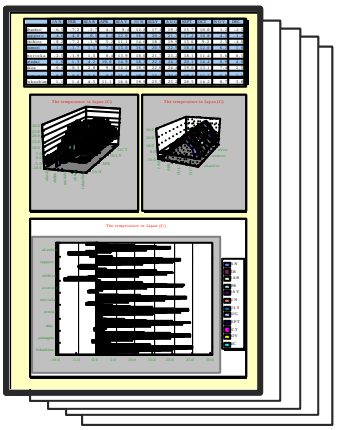
Testing environment

OS: Windows 98

CPU: 400MHz

Interface: Parallel





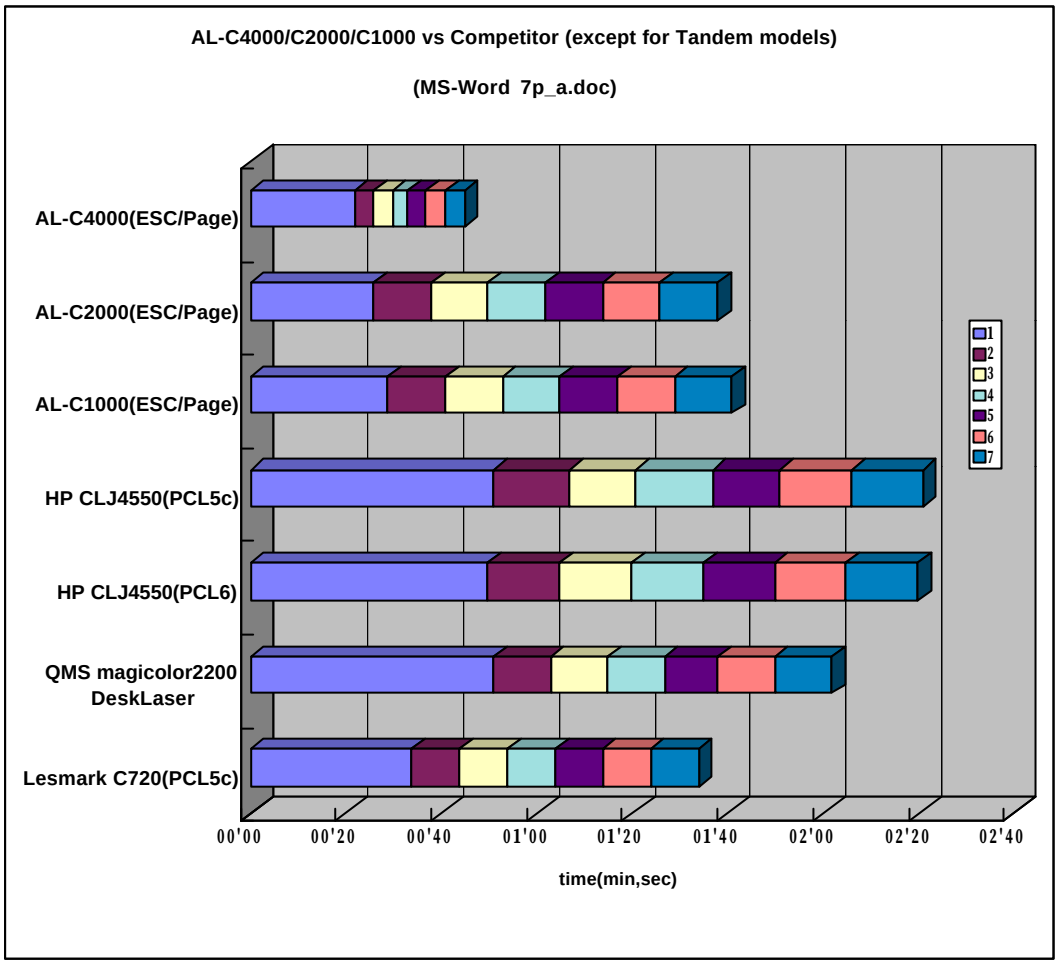
Performance of AcuLaser C4000 vs. C1000, C2000 and competitive printers (Excel)

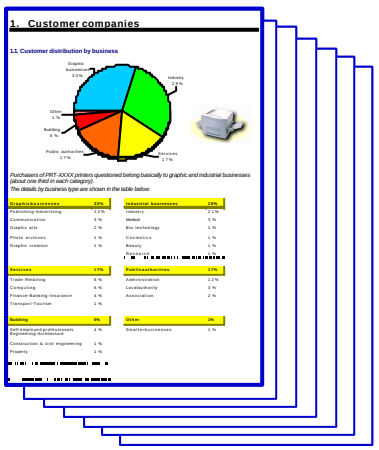
Testing environment

OS: Windows 98

CPU: 400MHz

Interface: Parallel





Performance of AcuLaser C4000 vs. C1000, C2000 and competitive printers (Word)

Testing environment

OS: Windows 98

CPU: 400MHz

Interface: Parallel

* Competitive tandem performance comparisons (Oki. Lexmark, QMS) with the AcuLaser C4000 will be added as soon as they are ready.

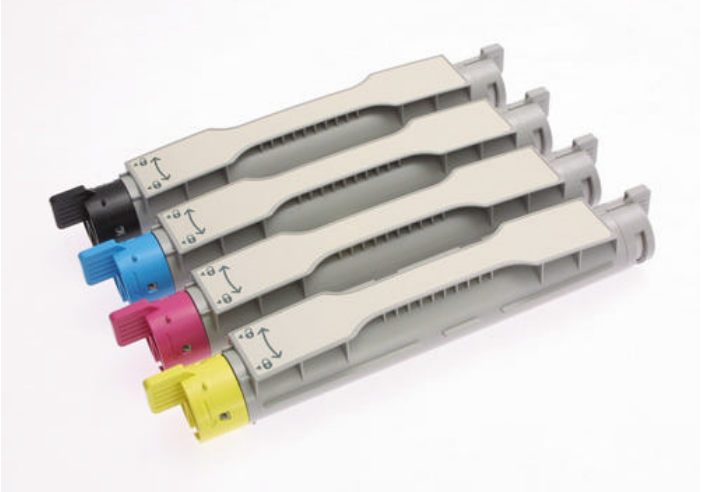
6. Options and consumables

6-1 Options

Large capacity lower cassette (500 sheets * 2 Cassettes)
PostScript (KENT)
Hard disk drive

Pc Hard disk drive

6-2 Consumables



K, C, M and Y toner cartridges

Photoconductor unit

Fuser unit

Transfer unit

Lifespan

Toner cartridges (C, M, Y):	6,000 pages each
Toner cartridge (K):	8,500 pages
Photoconductor unit:	30,000 pages
Transfer unit:	25,000 pages
Fuser unit:	100,000 pages

7. Specifications

Specification	Epson AcuLaser C4000
Resolution	True1200dpi, 600dpi, 300dpi
Printing speed	Color 16ppm, monochrome 16 ppm (A4/LT at 600/300dpi)
	Color 8 ppm, monochrome 8 ppm (A4/LT at 1200dpi)
CPU	PowerPC 750CX 400MHz
Font	ESC/Page-Color Mode: 84 scalable fonts + 7 bitmap fonts LJ (PCL) Mode: 80 scalable fonts + 7 bitmap fonts ESC/P2 Mode: 10 typefaces FX Mode: 8 typefaces IBM Mode: 8 typefaces
Standard paper cassette	Capacity: 500 sheets
	Paper size: A4, A5, B5, LT, LGL, GLG, EXE
Multi-purpose tray	Capacity: 100 sheet
	Paper size: A4, A5, B5, LT, HLT, EXE, GLT, GLG, LGL, Monarch, C10, DL, C5, C6, IB5, F4
	Width: 88.9 to 215.9 mm, Length: 139.7 to 355.6 mm
Large capacity paper unit (option)	Capacity: 1,000 sheets (500-sheet cassette x 2)
	Paper size: A4, A5, B5, LT, LGL, GLG, EXE
Paper eject/capacity	Face down (maximum 250 sheets)
Duplex printing	Standard
Printer control language	Standard: ESC/Page-Color, ESC/P2, PCL5e, FX, IBM Mode (1239X), EPSON GL/2
	Option: Adobe PostScript 3
Interface standard	IEEE1248 Bi-directional parallel interface with compatibility mode, nibble mode and ECP mode
	Universal Serial Bus (USB) 1.1 compliant
	Ethernet 10/100 base Tx
Interface option	1 slot for Type B interface card
Memory	64MB (expandable to 1024MB by SDRAM DIMM)
Warm up time	30 or less seconds
First print time	Less than 15 seconds (MP tray: A4/LT) Less than 15.5 seconds (standard lower cassette:A4/LT)
Acoustic noise	Stand by: less than 35db (A)
	During operation: less than 52db (A)
Durability	5 years or 300,000 pages whichever comes first
Environmental conditions (operating)	Temperature: 5 to 32°C (41.0 to 89.6 °F)
	Humidity: 15 to 85% RH
Power requirements	Power supply/frequency: 120V ± 10%, 220/240V ± 10%
Power consumption	Maximum: 850 W

	Operation: less than 450 Wh
	Standby mode: less than 180 Wh
	Sleep mode: less than 45 Wh
Dimensions	439 (W) × 638 (D) × 445 (H)
Weight	34.5kg (including consumables)
Printer driver/utility	Printer Driver for: Microsoft® Windows® 95/98/ME/2000/ XP, Windows NT™ version 4.0, Mac™ OS 8.1 or later (excluding Mac™ OS X)
	EPSON Status Monitor 3 for: Microsoft® Windows® 95/98/ ME/2000/XP, Windows NT™ version 4.0, Mac™ OS 8.1 or later (excluding Mac™ OS X)
	EPSON Font Manager for: Microsoft® Windows® 95/98/ ME/2000/XP, Windows NT™ version 4.0
	EPSON Printer Port for: Microsoft® Windows® 2000/XP
	EPSON Bar Code fonts for: Microsoft® Windows® 95/98/ ME/2000/XP, Windows NT™ version 4.0
	EpsonNet WinAssist for: Microsoft® Windows® 95/98/ ME/2000/XP, Windows NT™ version 4.0
	EpsonNet MacAssist for: Mac™ OS 8.1 or later
	EpsonNet WebManager for: Microsoft® Windows® 95/98/ ME/2000/XP, Windows NT™ version 4.0
	EpsonNet Direct Print for: Microsoft® Windows® 95/98/ ME/2000/XP, Windows NT™ version 4.0
	EpsonNet Internet Print for: Microsoft® Windows® 95/98, Windows NT™ version 4.0
	EpsonNet NDSP Gateway for: Microsoft® Windows® 95/98, Windows NT™ version 4.0/ Novell® NetWare® 5.0/5.1
Control panel	1-line, 20-character LED display with 3 LED & 6 switches
Consumables	Toner cartridge Black: life span 8,500 pages (C13S050091) Yellow: life span 6,000 pages (C13S050088) Magenta: life span 6,000 pages (C13S050089) Cyan: life span 6,000 pages (C13S050090)
	Photoconductor unit: life span 30.000 pages (C13S051081)
	Fuser unit 220V: life span 100,000 pages (C13S053007) 120V: life span 100,000 pages (C13S053008)
	Transfer unit: life span 25,000 pages (C13S053006)
Options	Large capacity paper unit (C12C813861)
	Hard disk drive (C12C8239121)
	Adobe PostScript 3 Kit (C12C832501)
	PS in-house installation kit (C12C832502)
	EpsonNet 10/100 Base Tx Int. Print Server2 (C12C823914)

	IEEE 1394 Type-B interface card (C12C82319)

Appendix 1. Color registration

When the printer is installed, users need to adjust the registration of printer engine to achieve optimum print quality. Except in cases when the printer is moved, the user does not have to make this setting twice.
Registration (4-color toner positions) of the paper feed direction is unnecessary because the 4-2-1 drums are rigid. However, the tandem engine has a 4-laser diode meaning that the user needs to adjust the laser scan position for the horizontal direction when the printer is installed.

Color registration allows users to make optimum color settings

Appendix 2. Memory requirements

Business documents

RAM expansion is not required for normal business documents created in Excel or Word.

Required RAM: 64 MB (standard)

Images

An additional 64MB of RAM (total 128MB) is recommended to print 600-dpi high-quality A4 full size images.

(This increases to an additional 128MB of RAM (total 192MB) when printing full A4 images at 1200dpi.)

Duplex printing

Duplex printing requires double the RAM of simplex prints.