HP LaserJet 4000, 4000 N, 4000 T, and 4000 TN Printers

Service Manual

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1 Printer Description

Overview

This chapter discusses the following:

- ☐ Printer Features
- ☐ Identification
- ☐ Site Requirements
- ☐ Paper Specifications
- ☐ Safety Information

Printer Features

Table 1-1. Printer Features

Speed	17 pages per minute (ppm) 100 MHz RISC microprocessor First Page Out = 15 sec.
Resolution	300 dpi with PCL5e/HP's PostScript™ Level 2 emulation (PS) 600 dpi with PCL5e/PS HP FastRes 1200 (PCL6 only) HP ProRes 1200 (PCL6, PS)
Typefaces	110 Scalable TrueType™ (80 built-in, 30 via FontSmart, all PS and PCL accessible)
Memory Options	HP LaserJet 4000/4000 T: 4 MB RAM standard HP LaserJet 4000 N/4000 TN: 8 MB RAM standard Optional Memory: 2, 4, 8, 16 MB EDO DIMMs 32 MB SDRAM DIMM
Expansion Slots	3 100-pin DIMM slots 2 enhanced I/O (EIO) slots
Interface	Bidirectional IEEE 1284 compliant parallel interface RS-232 9-pin serial Paper Handling Connector (PHC)
Optional Networking	10Base-T and 10Base-2 10/100Base-TX Token Ring LocalTalk
Mass Storage Options	2 and 4 MB Flash DIMMs

Table 1-1. Printer Features (continued)

Paper Trays	100-sheet Tray 1 Size: 3 by 5 to legal (76 by 127 mm to 216 by 356 mm) 500-sheet Tray 2 (HP LaserJet 4000/ 4000 N) Size: letter, legal, A4 250-sheet Trays 2 and 3 (HP LaserJet 4000 T/ 4000 TN) Size: letter, A4, executive, legal, B5 (ISO), B5 (JIS), A5 Optional Universal 500-sheet Tray supports standard and custom sizes from 5.8 by 8.2 in (149 by 210 mm) to 8.5 by 14 in (216 by 356 mm).
Paper Path	Straight through from Tray 1 to rear output bin Or to top output bin
Output Capacity	250-sheet top output bin 50-sheet rear output bin
Paper Handling Options	Duplexer, Envelope Feeder, optional 500-sheet universal tray assembly

Table 1-2. Comparison of HP LaserJet 4000 Series Printers

	HP LaserJet 4000	HP LaserJet 4000 T	HP LaserJet 4000 N	HP LaserJet 4000 TN
Ethernet 10-T/ 10-2	optional	optional	standard	standard
Max. # input bins	3	4	3	4
Standard RAM	4 MB internal	4 MB internal	8 MB internal	8 MB internal
250-Sheet Tray	not available	2 standard	not available	2 standard
500-Sheet Tray	standard	optional	standard	optional
500-Sheet Universal Tray	optional	optional	optional	optional

Table 1-2. Comparison of HP LaserJet 4000 Series Printers (continued)

	HP LaserJet 4000	HP LaserJet 4000 T	HP LaserJet 4000 N	HP LaserJet 4000 TN
1 GB EIO Drive	optional	optional	optional	optional
Envelope feeder	available	available	available	available
LocalTalk	optional	optional	standard	standard
10Base-2	optional	optional	optional	optional
Duplexer	optional	optional	optional	optional

Model and Serial Numbers

The model number and serial numbers are listed on identification labels located under the top cover on the right side of the printer. The model number is alphanumeric, such as USEB000194 for the HP LaserJet 4000 N printer.

The serial number contains information about the Country of Origin, the Revision Level, the Production Code, and Production Number of the printer.

The rear labels also contain power rating and regulatory information as shown in Figure 1-1.

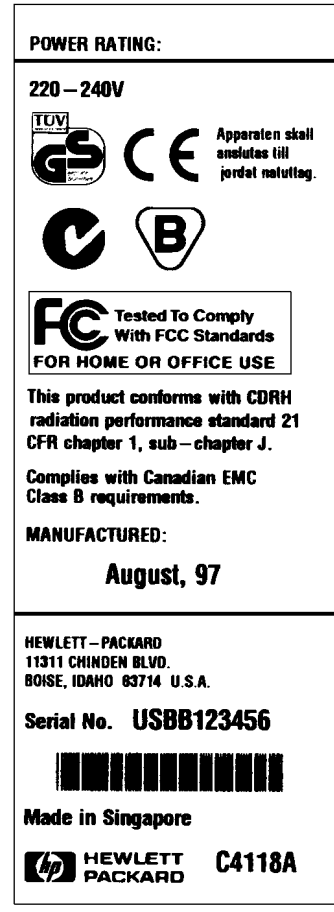

Figure 1-1 Sample Labels

Site Requirements

The following environmental specifications must be maintained to ensure the proper operation of the printer. Consider the following points before installing the printer:

- Install in a well-ventilated, dust-free area.
- Install on a hard, flat and continuous surface, with all four printer feet level. Do not install on carpet or other soft surfaces.
- Ensure adequate power is supplied. Printer power requirements are listed in Table 1-3.
- Install where temperature and humidity is stable, away from water sources, humidifiers, air conditioners, refrigerators, or other major appliances.
- Install away from direct sunlight, open flames, or ammonia fumes. If the printer is placed near a window, make sure the window has a curtain or blind to block any direct sunlight.
- Install with enough space around the printer for proper access and ventilation.
- Install printer away from the direct flow of exhaust from air ventilation systems.

Table 1-3. Electrical Specifications

Volts	Frequency	Amps	Watts (typical)
100-127 VAC±10%	50/60 Hz ±3Hz	8 amps	printing = 330 standby = 18 PowerSave On = 16 (EPA ENERGY STAR®)
220-240 VAC±10%	50/60 Hz ±3Hz	4 amps	printing = 330 standby = 18 PowerSave On = 16 (EPA ENERGY STAR®)

Space Requirements

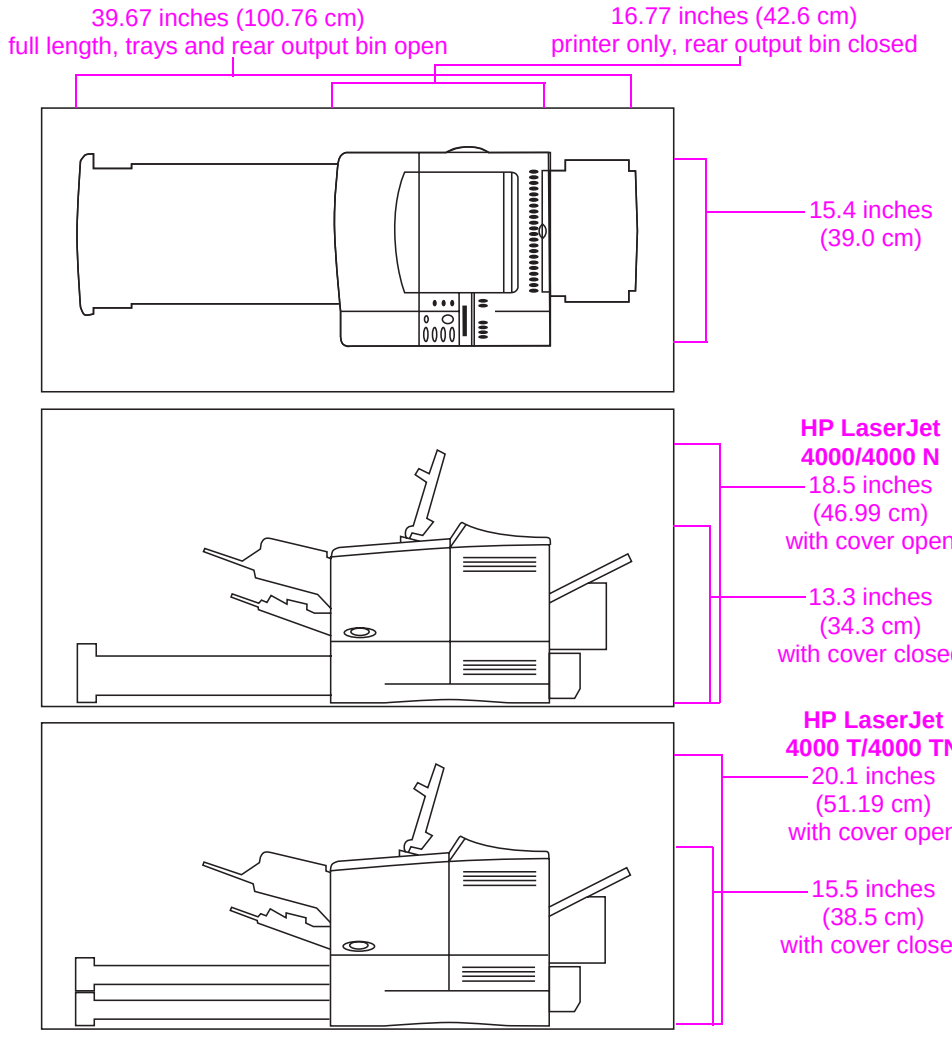

Figure 1-2 Printer Dimensions

Printer Weight (without toner cartridge)

- HP LaserJet 4000/4000 N printers: 39.27 lb (17.85 kg)
- HP LaserJet 4000 T/4000 TN printers: 45.66 lb (20.71 kg)

Table 1-4. Printer and Toner Cartridge Environmental Conditions

Item	Operating	Storage
Temperature	50-91° F (10-32° C)	32 TO 95°F (0 to 35°C)
Relative Humidity	20-80% RH (with no condensation)	10% TO 95% RH

Table 1-5. Acoustic Emissions (Per ISO 9296)

Printer State	Sound Power
Printing, 17 pages per minute (ppm)	L_{wad}= 6.6 bels (A)
Printing, 8 ppm	L_{wad}= 6.2 bels (A)
PowerSave	L_{wad}= 0 bels (A)

Paper Specifications

The following tables show paper specifications for the printer.

Table 1-6. Paper Specifications, Tray 1

Supported Paper	Dimensions[1]	Weight	Capacity[2]
Minimum Size (custom)	3 by 5 in (76 by 127 mm)	16 to 53 lb (60 to 199 g/m^2)	100 sheets of 20 lb (75 g m^2) paper
Maximum Size	8.5 by 14 in (216 by 356 mm)		
Transparencies	Same as minimum and maximum paper sizes listed above.	Thickness: 0.0039 in to 0.0045 in (0.099 to 0.114 mm)	75 transparencies
Labels		Thickness: 0.005 in to 0.007 in (0.127 mm to 0.178 mm)	50 labels
Envelopes		20 to 28 lb (75 to 105 g/m^2)	10 envelopes

1. The printer supports a wide range of paper sizes. Check the printer software for supported sizes. To print custom-size paper see the user's guide.
2. Capacity may vary depending on paper weight and thickness, and environmental conditions.

Table 1-7. Paper Specifications, Tray 2 (HP LaserJet 4000/4000 N)

Supported Paper	Dimensions[1]	Weight	Capacity[2]
Letter	8.5 by 11 in (216 by 279 mm)	16 to 28 lb (60 to 105 g/m^2)	500 sheets of 20 lb (75 g/m^2) paper 50-100 transparencies
A4	8.3 by 11.7 in (210 by 297 mm)		
Legal	8.5 by 14 in (216 by 356 mm)		

1. The printer supports a wide range of paper sizes. Check the printer software for supported sizes.
2. Capacity may vary depending on paper weight and thickness, and environmental conditions.

Table 1-8. Paper Specifications, Trays 2 and 3 (HP LaserJet 4000 T/4000 TN)

Supported Paper	Dimensions[1]	Weight	Capacity[2]
Letter	8.5 by 11 in (216 by 279 mm)	16 to 28 lb (60 to 105 g/m^2)	250 sheets of 20 lb (75 g/m^2) paper 50-100 transparencies
A4	8.3 by 11.7 in (210 by 297 mm)		
Executive	7.3 by 10.5 in (191 by 267 mm)		
Legal	8.5 by 14 in (216 by 356 mm)		
B5 (ISO) (custom[3])	6.9 by 9.9 in (176 by 250 mm)		
B5 (JIS)	7.2 by 10 in (182 by 257 mm)		
A5 (custom[3])	5.8 by 8.2 in (148 by 210 mm)		

1. The printer supports a wide range of paper sizes. Check the printer software for supported sizes.
2. Capacity may vary depending on paper weight and thickness, and environmental conditions.
3. To print custom-size paper see the user's guide.

Table 1-9. Paper Specifications, Optional 500-Sheet Tray

Supported Paper	Dimensions[1]	Weight	Capacity[2]
Letter	8.5 by 11 in (216 by 279 mm)	16 to 28 lb (60 to 105 g/m^2)	500 sheets of 20 lb (75 g/m^2) paper 50-100 transparencies
A4	8.3 by 11.7 in (210 by 297 mm)		
Executive	7.3 by 10.5 in (191 by 267 mm)		
Legal	8.5 by 14 in (216 by 356 mm)		
B5 (ISO) (custom[3])	6.9 by 9.9 in (176 by 250 mm)		
B5 (JIS)	7.2 by 10 in (182 by 257 mm)		
A5 (custom[3])	5.8 by 8.2 in (148 by 210 mm)		
Custom[3]	5.8 by 8.2 in to 8.5 by 14 in (149 by 210 mm to 216 by 356 mm)		

1. The printer supports a wide range of paper sizes. Check the printer software for supported sizes.
2. Capacity may vary depending on paper weight and thickness, and environmental conditions.
3. To print custom-size paper see the user's guide.

Table 1-10. Paper Specifications, Optional Envelope Feeder

Supported Paper	Dimensions[1]	Weight	Capacity[2]
Minimum Size	3.5 by 6.3 in (90 by 160 mm)	20 to 28 lb (75 to 105 g/m^2)	75 envelopes
Maximum Size	7 by 10 in (178 by 254 mm)		

1. The printer supports a wide range of paper sizes. Check the printer software for supported sizes.
2. Capacity may vary depending on paper weight and thickness, and environmental conditions.

Table 1-11. Paper Specifications, Optional Duplex Printing Accessory (Duplexer)

	Dimensions	Weight	Capacity
Letter	8.5 by 11 in (216 by 279 mm)	16 to 28 lb (60 to 105 g/m^2)	not applicable
A4	8.3 by 11.7 in (210 by 297 mm)		
Executive	7.3 by 10.5 in (191 by 267 mm)		
Legal	8.5 by 14 in (216 by 356 mm)		
B5 (JIS)	7.2 by 10 in (182 by 257 mm)		

Supported Types of Paper

The printer supports the following types of paper:

- plain
- letterhead
- prepunched
- bond
- color
- rough
- preprinted
- transparency
- labels
- recycled
- card stock
- user-defined (5 types)

Guidelines for Using Paper

For best results, use conventional 20 lb (75 g/m^2) paper. Make sure the paper is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, and curled or bent edges.

Some paper causes print quality problems, jamming, or damage to the printer.

Table 1-12. Guidelines for Using Paper

Symptom	Problem with Paper	Solution
Poor print quality or toner adhesion. Problems with feeding.	Too moist, too rough, too smooth, or embossed; faulty paper lot.	Try another kind of paper, between 100-250 Sheffield, 4-6% moisture content.
Dropouts, jamming, curl.	Stored improperly.	Store paper flat in its moisture-proof wrapping.
Increased gray background shading.	Too heavy.	Use lighter paper. Open the rear output bin.
Excessive curl. Problems with feeding.	Too moist, wrong grain direction or short-grain construction.	Open the rear output bin. Use long-grain paper.
Jamming, damage to printer.	Cutouts or perforations.	Do not use paper with cutouts or perforations.
Problems with feeding.	Ragged edges.	Use quality paper.

Note

Do not use letterhead paper that is printed with low-temperature inks, such as those used in some types of thermography.

Do not use raised letterhead.

The printer uses heat and pressure to fuse toner to the paper. Make sure that any colored paper or preprinted forms use inks that are compatible with the printer's temperature (400° F or 205° C for 0.1 second).

Paper Weight Equivalence Table

Use this table to determine approximate equivalent points in weight specifications other than U.S. bond weight. For example, to determine the equivalent of 20 lb U.S. bond weight paper in U.S. cover weight, locate the bond weight (in row 3, second column) and scan across the row to the cover weight (in the fourth column). The equivalent is 28 lb.

Shaded areas indicate a standard weight for that grade.

Table 1-13. Paper Weight Equivalence

	U.S. Post Card[1] thick-ness (mm)	U.S. Bond Weight (lb)	U.S. Text/Book Weight (lb)	U.S. Cover Weight (lb)	U.S. Bristol Weight (lb)	U.S. Index Weight (lb)	U.S. Tag Weight (lb)	Europe Metric Weight (g/m2)	Japan Metric Weight (g/m2)
1		16	41	22	27	33	37	60	60
2		17	43	24	29	35	39	64	64
3		20	50	28	34	42	46	75	75
4		21	54	30	36	44	49	80	80
5		22	56	31	38	46	51	81	81
6		24	60	33	41	50	55	90	90
7		27	68	37	45	55	61	100	100
8		28	70	39	49	58	65	105	105
9		32	80	44	55	67	74	120	120
10		34	86	47	58	71	79	128	128
11		36	90	50	62	75	83	135	135
12	.18	39	100	55	67	82	91	148	148
13	.19	42	107	58	72	87	97	157	157
14	.20	43	110	60	74	90	100	163	163
15	.23	47	119	65	80	97	108	176	176
16		53	134	74	90	110	122	199	199

1. U.S. Post Card measurements are approximate. Use for reference only.

Labels

CAUTION To avoid damaging the printer, use only labels recommended for use in laser printers.

If you have problems printing labels, use Tray 1 and open the rear output bin.

Never print on the same sheet of labels more than once.

Label Construction

When selecting labels, consider the quality of each component:

- **Adhesives:** The adhesive material should be stable at 400° F (205° C), the printer's maximum temperature.
- **Arrangement:** Only use labels with no exposed backing between them. Labels can peel off of sheets that have spaces between the labels, causing serious jams.
- **Curl:** Prior to printing, labels must lie flat with no more than 0.5 in (13 mm) of curl in any direction.
- **Condition:** Do not use labels with wrinkles, bubbles, or other indications of separation.

Transparencies

Transparencies used in the printer must be able to withstand 400° F (205° C), the printer's maximum temperature. For best results, close the rear output bin to print transparencies to the top output bin.

CAUTION To avoid damaging the printer, use only transparencies recommended for use in laser printers.

If you have problems printing transparencies, use Tray 1.

Envelopes

Envelope Construction

Envelope construction is critical. Envelope fold lines can vary considerably, not only between manufacturers, but also within a box from the same manufacturer. Successful printing on envelopes depends upon the quality of the envelopes. When selecting envelopes, consider the following components:

- **Weight:** The weight of the envelope paper should not exceed 28 lb (105 g/m^2), or jamming may result.
- **Construction:** Prior to printing, envelopes should lie flat with less than 0.25 in (6 mm) curl, and should not contain air. (Envelopes that trap air may cause problems.)
- **Condition:** Make sure envelopes are not wrinkled, nicked, or otherwise damaged.
- **Sizes in Tray 1:** From 3 by 5 inches (76 by 127 mm) to 8.5 by 14 inches (216 by 356 mm).
- **Sizes in the optional envelope feeder:** From 3.5 by 6.3 in (90 by 160 mm) to 7 by 10 in (178 by 254 mm).

If you do not have an optional envelope feeder, always print envelopes from Tray 1. If envelopes wrinkle, try opening the rear output bin.

Envelopes with Double-Side-Seams

Double-side-seam construction has vertical seams at both ends of the envelope rather than diagonal seams. This style may be more likely to wrinkle. Be sure the seam extends all the way to the corner of the envelope as illustrated below.

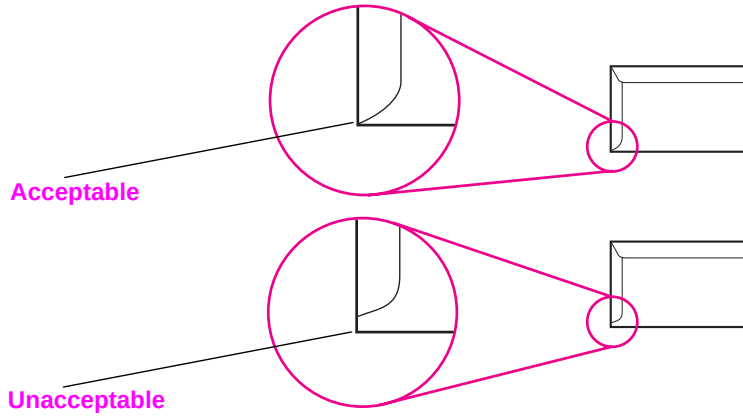

Figure 1-3 Envelopes with Double-Side-Seams

Envelopes with Adhesive Strips or Flaps

Envelopes with a peel-off adhesive strip or with more than one flap that folds over to seal must use adhesives compatible with the heat and pressure in the printer. The extra flaps and strips might cause wrinkling, creasing, or jams.

Envelope Margins

The following table gives typical address margins for a Commercial #10 or DL envelope.

Table 1-14. Envelope Margins

Type of Address	Top Margin	Left Margin
Return Address	0.6 in (15 mm)	0.6 in (15 mm)
Delivery Address	2 in (51 mm)	3.5 in (89 mm)

Note For the best print quality, position margins no closer than 0.6 in (15 mm) from the edges of the envelope.

Envelope Storage

Proper storage of envelopes helps contribute to good print quality. Envelopes should be stored flat. If air is trapped in an envelope, creating an air bubble, then the envelope may wrinkle during printing.

Card Stock and Heavy Paper

Many types of card stock can be printed from Tray 1, including index cards and postcards. Some card stock performs better than others because its construction is better suited for feeding through a laser printer.

For optimum printer performance, do not use paper heavier than 53 lb (199 g/m^2) in Tray 1 or 28 lb (105 g/m^2) in other trays. Paper that is too heavy might cause misfeeds, stacking problems, paper jams, poor toner fusing, poor print quality, or excessive mechanical wear.

Note Printing on heavier paper may be possible if the tray is not filled to capacity, and paper with a smoothness rating of 100-180 Sheffield is used.

Card Stock Construction

- **Smoothness:** 36-53 lb (135-199 g/m^2) card stock should have a smoothness rating of 100-180 Sheffield. 16-36 lb (60-135 g/m^2) card stock should have a smoothness rating of 100-250 Sheffield.
- **Construction:** Card stock should lie flat with less than 0.2 in (5 mm) of curl.
- **Condition:** Make sure card stock is not wrinkled, nicked, or otherwise damaged.
- **Sizes:** Use only card stock within the following size ranges:
  - minimum: 3 by 5 in (76 by 127 mm)
  - maximum: 8.5 by 14 in (216 by 356 millimeters)

Note Before loading card stock in Tray 1, make sure it is regular in shape and not damaged. Also, make sure the cards are not stuck together.

Card Stock Guidelines

- If cards curl or jam, try printing from Tray 1 and opening the rear output bin.
- Set margins at least 0.08 in (2 mm) away from the edges of the paper.

Safety Information

Laser Safety Statement

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration has implemented regulations for laser products manufactured since August 1, 1976. Compliance is mandatory for products marketed in the United States. The printer is certified as a “Class 1” laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. Since radiation emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape during any phase of normal user operation.

WARNING! Using controls, making adjustments, or performing procedures other than those specified in this service manual may result in exposure to hazardous radiation.

Canadian DOC Regulations

Complies with Canadian EMC Class B requirements.

<<Conforme á la classe B des normes canadiennes de compatibilité électromagnétiques. << CEM>>.>>

FCC Regulations

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy. If this equipment is not installed and used in accordance with the instructions, it may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase separation between equipment and receiver.
- Connect equipment to an outlet on a circuit different from that to which the receiver is located.
- Consult your dealer or an experienced radio/TV technician.

Note

Any changes or modifications to the printer that are not expressly approved by HP could void the user's authority to operate this equipment.

Use of a shielded interface cable is required to comply with the Class B limits of Part 15 of FCC rules.

Laser Statement for Finland

LASERTURVALLISUUS

LUOKAN 1 LASERLAITE

KLASS 1 LASER APPARAT

HP LaserJet 4000, 4000 T, 4000 N, 4000 TN -laserkirjoitin on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä kirjoittimen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle.

Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1993) mukaisesti.

VAROITUS !

Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkymättömälle lasersäteilylle.

VARNING !

Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för osynlig laserstrålning, som överskrider gränsen för laserklass 1.

HUOLTO

HP LaserJet 4000, 4000 T, 4000 N, 4000 TN -kirjoittimen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö. Tällaiseksi huoltotoimenpiteeksi ei katsota väriainekasetin vaihtamista, paperiradan puhdistusta tai muita käyttäjän käsikirjassa lueteltuja, käyttäjän tehtäväksi tarkoitettuja ylläpitotoimia, jotka voidaan suorittaa ilman erikoistyökaluja.

VARO !

Mikäli kirjoittimen suojakotelo avataan, olet alttiina näkymättömälle lasersäteilylle laitteen ollessa toiminnassa. Älä katso säteeseen.

VARNING !

Om laserprinterns skyddshölje öppnas då apparaten är i funktion, utsättas användaren för osynlig laserstrålning. Betrakta ej strålen.

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

Aallonpituus 770-795 nm

Teho 5 mW

Luokan 3B laser

Toner Safety

Note Toner may stain clothing. Skin and clothing are best cleaned by removing as much toner as possible with a dry tissue, then washing with cold water. Hot water causes toner to melt and permanently fuse into clothing.

A Material Safety Data Sheet (MSDS) for the toner cartridge used in the HP printers, is available through Hewlett-Packard by mail or fax.

Mail. To obtain a MSDS for the C4127X HP LaserJet Toner Imaging System through the mail, call the Customer Information Center (CIC) at 1-800-752-0900 between 6 am and 5 pm Pacific Standard Time.

Fax. To obtain a MSDS for the C4127X HP LaserJet Toner Imaging System by fax, call the HP FIRST number at (800) 333-1917 (U.S. and Canada) and request document number 1512.

Note To get documents from HP FIRST by fax, you must use a Group 3 fax machine.