



Troubleshooting

To better help our customers - this HP Color Laserjet 4600 series troubleshooting page is simply a guide / additional information for your convenience, as you search for assistance in repairing your machine. Although this information is provided for your convenience it is recommended, for the most part, that a technician inspects your office equipment.

It is recommended to consult with a professional when ordering your printer part(s).

Chapter contents

- Paper path troubleshooting
 - Jams
 - Jam locations
 - Jam locations by error message
 - Paper jam recovery
 - Avoiding paper jams
 - Persistent jams
- Paper transport troubleshooting
 - Multiple pages are fed
 - Paper is wrinkled or folded
 - Paper is skewed
- Image formation troubleshooting
 - Print quality problems associated with media
 - Overhead transparency defects
 - Print quality problems associated with the environment.
 - Print quality problems associated with jams
 - Print quality troubleshooting pages
 - Understanding color variations
 - Color selection process
 - Matching colors
 - Using color
 - Color options
 - Adjusting color balance

Paper path troubleshooting

Jams

Jam error messages occur if paper fails to arrive at or clear the paper path sensors in the allowed time. Dedicated paper sensors detect whether paper is present in the sensor and if paper is fed normally. When the DC controller detects a jam, it immediately stops the printing process and displays the appropriate jam message for the sensor that detects the jam. Figure 7-19 on page 299 shows the locations of all the sensors in the printer.

Jam locations

Jams occur in the areas shown in Figure 7-2. Jam messages correlate with these areas. For instructions on clearing jams, see the sections later in this chapter.

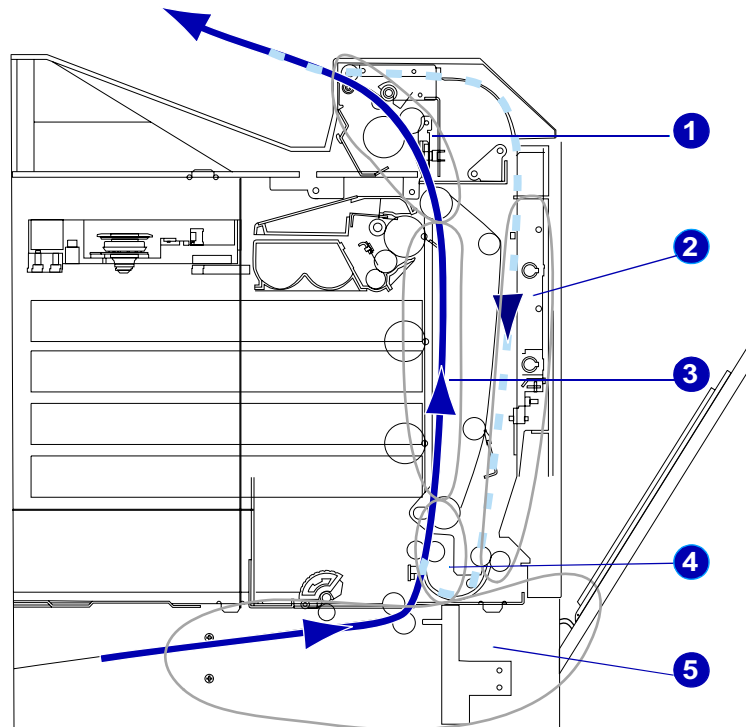


Figure 7-2 Jam locations

- 1 top cover area
- 2 duplex path
- 3 paper path
- 4 paper input path
- 5 trays

Jam locations by error message

Use Table 7-4 to help pinpoint and clear specific paper jams. See Figure 7-2 for jam locations.

Table 7-4 Error messages and associated jam locations

Error message	Jam location	Action
13.01.00 JAM IN TRAY X	5	Media is delayed in the feed area of the specified tray. <ol style="list-style-type: none"> 1 Open the covers and the ETB. 2 Pull media by both corners to remove it.
13.02.00 JAM IN TRAY X	5	Media is stuck in the feed area of the specified tray. <ol style="list-style-type: none"> 1 Open the covers and the ETB. 2 Pull media by both corners to remove it.
13.05.00 JAM IN PAPER PATH	3	Media is delayed in the paper input path or has not reached the fuser paper sensor in the expected time. <ol style="list-style-type: none"> 1 Open the covers and the ETB. 2 Pull media by both corners to remove it.
13.09.00 JAM IN TOP COVER AREA	1	Media has crumpled into an accordion fold as it enters the fuser. <ol style="list-style-type: none"> 1 Open the top cover. <p>WARNING! The fuser is hot, wait 10 minutes for it to cool down.</p> <ol style="list-style-type: none"> 2 Firmly lift the two green handles on either side of the fuser to disengage the fuser rollers. 3 Open the fuser cover, and remove the media. 4 Firmly press down on the two green handles on either side of the fuser to re-engage the fuser rollers.
13.0A.00 JAM IN TOP COVER AREA	1	During a duplex print job, media was delayed in the output bin before it entered the duplex path. <ol style="list-style-type: none"> 1 Open the top cover. <p>WARNING! The fuser is hot, wait 10 minutes for it to cool down.</p> <ol style="list-style-type: none"> 2 Firmly lift the two green handles on either side of the fuser to disengage the fuser rollers. 3 Pull media by both corners to remove it. 4 Firmly press down on the two green handles on either side of the fuser to re-engage the fuser rollers.
13.12.00 JAM IN DUPLEX PATH	2	During a duplex print job, media was removed from the output bin before it entered the duplex path, or media has entered the duplex path, but it is stuck. <ol style="list-style-type: none"> 1 Open the top cover and the front cover. (Do not open the ETB.) 2 Pull media by both corners to remove it.
13.21.00 JAM IN PAPER PATH	3	One of the covers is not completely closed. Ensure both covers are closed before printing. <ol style="list-style-type: none"> 1 Open the covers and the ETB. 2 Pull media by both corners to remove it.

Paper jam recovery










This printer automatically provides paper jam recovery, a feature that allows you to set whether the printer should attempt to automatically reprint jammed pages. The options are:

- **AUTO** Printer will attempt to reprint jammed pages.
- **OFF** Printer will not attempt to reprint jammed pages.

Note

During the recovery process, the printer may reprint several pages that were printed properly before the paper jam occurred. Be sure to remove any duplicated pages.

To disable paper jam recovery

- 1 Press  to enter the MENUS.
- 2 Press  to highlight CONFIGURE DEVICE.
- 3 Press  to select CONFIGURE DEVICE.
- 4 Press  to highlight SYSTEM SETUP.
- 5 Press  to select SYSTEM SETUP.
- 6 Press  to highlight JAM RECOVERY.
- 7 Press  to select JAM RECOVERY.
- 8 Press  to highlight OFF.
- 9 Press  to select OFF.
- 10 Press the **PAUSE/RESUME** button to return to the READY state.

To improve print speed and increase memory resources, you may want to disable paper jam recovery. If paper jam recovery is disabled, the pages involved in a jam will not be reprinted.

Avoiding paper jams

Table 7-5 lists common causes of paper jams and suggests solutions for resolving them.

Table 7-5 Common causes of paper jams

Cause	Solution
Print media does not meet HP-recommended media specifications.	Use only media that meets HP specifications. See Table 1-8, "Supported media specifications," on page 29.
A supply item is installed incorrectly, causing repeated jams.	Verify that all print cartridges, the ETB, and the fuser are correctly installed.
You are reloading paper that has already passed through a printer or copier.	Do not use media that has been previously printed on or copied.
An input tray is loaded incorrectly.	Remove any excess media from the input tray. Press media down in the input tray so it fits below the tabs and within the media width guides.
Print media is skewed.	Input tray guides are not adjusted correctly. Adjust input tray guides so they hold media firmly in place without bending it. If media heavier than 105 g/m ² (28 lb) is loaded into Tray 2 or Tray 3, the media might skew.
Print media is binding or sticking together.	Remove media, flex it, rotate it 180 degrees, or flip it over. Reload media into the input tray. Do not fan media.
Print media is removed before it settles into the output bin.	Reset the printer. Wait until the page completely settles in the output bin before removing it.
When duplexing, the print media is removed before the second side of the document is printed.	Reset the printer and print the document again. Wait until the page completely settles in the output bin before removing it.
Print media is in poor condition.	Replace the print media.
Print media is not picked up by the internal rollers from Tray 2 or Tray 3.	Remove the top sheet of media. If the media is heavier than 105 g/m ² (28 lb), it may not be picked from the tray.
Print media has rough or jagged edges.	Replace the media.
Print media is perforated or embossed.	This media does not separate easily. You might need to feed single sheets from Tray 1.
Printer supply items have reached the end of their useful life.	Check the printer control panel for messages prompting you to replace supplies, or print a supplies status page to verify the remaining life of the supplies.
Media was not stored correctly.	Replace the print media. Media should be stored in the original packaging in a controlled environment.

Persistent jams

If jams occur repeatedly, use the information in this section to diagnose the root cause of the problem. The tables in this section list possible causes and recommended solutions for jams in each area of the paper path. Items are listed in the order you should investigate. In general, items at the beginning of the list are relatively minor repairs. Items at the end of the list are more significant repairs.

Basic troubleshooting for paper jams

The basic troubleshooting process for paper jams consists of the following:

- 1 Gather data.
- 2 Identify the cause of the problem.
- 3 Fix the problem.

Data collection

To troubleshoot paper jams, gather the following information:

- the exact paper jam error code displayed on the control panel
- the location of the leading edge of the paper in the paper path
- whether paper is in the paper path when the jam occurs, or if paper is stuck in the input tray
- whether the jam occurs at power-up or while paper is moving
- whether the paper is damaged, and if it is, where the damage occurs on the paper and where in the paper path the paper stops
- whether the jam occurs when feeding from one particular tray
- whether the jam occurs only when duplex printing
- whether a particular type of paper is jamming or not jamming
- whether any of the supplies are non-HP (non-HP supplies are known to cause paper jams)
- whether the customer is storing the paper correctly, overloading the trays, damaging the edge of the paper during loading, or using paper that has already been fed through the printer

General paper path troubleshooting

Use the following suggestions to isolate the cause of the problem. Once you have identified the cause, use the tables that follow to find a recommended solution.

Note

Use the paper path test in the Diagnostics menu to print pages while troubleshooting. See page 287 for information about the paper path test.

- View or print the event log and determine if a particular jam error occurs more often than others. Try to identify a pattern.
- From the event log, determine the frequency of a particular jam. If a jam occurs repeatedly around the same page count, consider this a single jam that the customer tried to clear.
- Try printing from all available input trays to identify whether the problem is isolated to one tray.
- Print the job in both simplex and duplex modes to identify if the problem occurs only in one mode or the other.
- Try printing on paper from an unopened ream that has been stored correctly. If the jam does not occur with this media, then the customer's media might be causing the problem.
- If the jam occurs from when the printer is turned on, check the paper path for small torn pieces of paper. Also check for broken sensors or flags, and check for loose or defective connections.
- If the paper is torn, folded, or wrinkled (typically along the leading edge), inspect the paper path for items that could be causing the damage.
- If the customer is using non-HP supplies, try replacing those supplies with genuine HP supplies to see if the problem goes away.
- If necessary, instruct the customer on proper media storage, correct loading technique, and printer operation. Make sure the customer knows not to grab paper in the output bin during duplex printing.

Paper path checklist

- Verify that media is correctly loaded in the input trays and that all length and width guides are set correctly.
- Clean the printer. Toner and paper dust in the paper path can inhibit free movement of media through the printer and can block the sensors.
- Use the paper path test in the Diagnostic menu to vary the input selections of the printer to determine if the problem is associated with a particular area of the printer.
- Worn rollers or separation pads can cause multifeeds. Check the condition of the pickup rollers and separation pads. Bent separation tabs (on the front corners of the input trays) can cause misfeeds and multifeeds. Replace the tray if necessary.
- Defective paper tray switches can cause jams by communicating the wrong paper size to the formatter.
- Defective paper sensors along the paper path might signal a false jam.
- Scraps of media left in the paper path can cause intermittent jams. Always check that the paper path is clear when cleaning the printer and when clearing jams. Also, remove the fuser and carefully check it for jam debris.

Jams in Tray 1

Table 7-6 Causes for jams in Tray 1

Cause	Solution
Pickup roller is dirty, worn, or damaged.	Clean the pickup roller. If it is still dirty after cleaning, or if it is worn or damaged, replace the pickup roller.
Separation pad is defective.	Clean the separation pad. If it is still dirty after cleaning, or if it is worn or damaged, replace the separation pad.
Drive gears are damaged.	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
Multi-purpose tray pickup solenoid is defective.	<ol style="list-style-type: none"> 1 Disconnect the connector J1020 for the multi-purpose tray pickup solenoid from the DC controller PCB. 2 Measure the resistance between the cable-side connectors J1020-11 and J1020-10. 3 If the measured resistance is NOT about 160 ohms, replace the multi-purpose tray pickup solenoid.
Pickup motor is defective.	Replace the paper pickup drive assembly.
Paper pickup assembly is defective.	Replace the paper pickup assembly.
DC controller PCB is defective.	Replace the DC controller PCB. Calibrate the printer after replacing the DC controller. See "Calibrate Now" on page 294.

Jams in Tray 2

Table 7-7 Causes for jams in Tray 2

Cause	Solution
Separation tabs in the paper cassette are deformed.	Straighten the tabs on the front corners of the tray, or replace the cassette.
Pickup roller is worn or damaged.	Replace the pickup roller.
Feed roller is dirty, worn, or damaged.	Clean the feed roller. If it is still dirty after cleaning, or if it is worn or damaged, replace the feed roller.
Drive gears are damaged.	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
Cassette pickup solenoid is damaged.	<ol style="list-style-type: none"> 1 Disconnect the connector for the cassette pickup solenoid from the DC controller PCB. 2 Measure the resistance between the cable-side connectors J1020-13 and J1020-12. 3 If the measured resistance is NOT about 160 ohms, replace the cassette pickup solenoid.
Pickup motor is defective.	Replace the paper pickup drive assembly.
Paper pickup assembly is defective.	Replace the paper pickup assembly.
DC controller PCB is defective.	Replace the DC controller PCB. Calibrate the printer after replacing the DC controller. See "Calibrate Now" on page 294.

Jams in Tray 3

Table 7-8 Causes for jams in Tray 3

Cause	Solution
Separation tabs in the paper cassette are deformed.	Straighten the tabs on the front corners of the tray, or replace the cassette.
Pickup roller is worn or damaged.	Replace the pickup roller.
Feed roller is dirty, worn, or damaged.	Clean the feed roller. If it is still dirty after cleaning, or if it is worn or damaged, replace the feed roller.
Drive gears are damaged.	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
Connector to the printer has poor contact.	Reconnect all connectors to the printer. Replace any damaged connectors.
Paper feeder pickup solenoid is damaged.	<ol style="list-style-type: none"> 1 Disconnect the connector J4006 for the paper feeder solenoid from the paper feeder PCB. 2 Measure the resistance between the cable-side connectors J4006-2 and J4006-1. 3 If the measured resistance is NOT about 160 ohms, replace the paper feeder pickup solenoid.
Pickup motor is defective.	Replace the paper pickup drive assembly.
Paper feeder PCB is defective.	Replace the paper feeder PCB.
Paper pickup assembly is defective.	Replace the paper pickup assembly.
DC controller PCB is defective.	Replace the DC controller PCB. Calibrate the printer after replacing the DC controller. See "Calibrate Now" on page 294.

Jams in the paper path

Table 7-9 Causes for jams in the paper path

Cause	Solution
Registration shutter is defective. (This applies to jams that occur before the registration roller.)	Make sure the shutter is clean, moves smoothly, and that the spring is in place. If the shutter is damaged, replace the paper pickup assembly.
Drive gears are damaged. (This applies to jams that occur before the registration roller.)	Check the drive gears in the paper pickup unit. Replace the pickup drive assembly if the gears are damaged.
Registration roller and registration sub roller are dirty, worn, or damaged. (This applies to jams that occur before the registration roller.)	Clean the registration roller or registration sub roller if it is dirty. If it is still dirty after cleaning, or if it is worn or damaged, replace the paper pickup assembly.
Attaching roller is damaged. (This applies to jams in which paper is crumpled into an accordion as it enters the ETB.)	Check if the attaching roller is damaged. If it is damaged, replace the ETB. Calibrate the printer after replacing the ETB. See "Calibrate Now" on page 294.
Cartridge shutter open/close mechanism is damaged. (This applies to jams in which paper is crumpled into an accordion fold somewhere on the ETB belt.)	The shutters in each print cartridge should open as you close the ETB. If a shutter does not open, replace that print cartridge. Also check for a damaged shutter mechanism in the printer.
Cartridge drive motor assembly is damaged.	Inspect the cartridge drive assembly in each print cartridge. If any are damaged, replace the assembly for that print cartridge.
Attaching roller is defective.	Make sure the attaching roller is clean and the spring is in place. If the roller is damaged, replace the ETB. Calibrate the printer after replacing the ETB. See "Calibrate Now" on page 294.
Paper leading edge sensor is defective.	Replace the pickup PCB.
DC controller PCB is defective.	Replace the DC controller PCB. Calibrate the printer after replacing the DC controller. See "Calibrate Now" on page 294.

Jams in the top cover

Table 7-10 Causes for jams in the top cover

Cause	Solution
Fuser paper sensor or sensor lever is defective.	Make sure the fuser paper sensor lever moves smoothly and is set in place. Replace the lever if it is damaged. Replace the sensor if it is defective.
Fuser sleeve or pressure roller does not rotate smoothly.	If the fuser drive gears are worn or damaged, replace the fuser.
Fuser inlet guide is dirty or has built-up toner.	Clean the fuser inlet guide.
Fuser sleeve or pressure roller is dirty, worn, or damaged.	Clean the fuser sleeve or pressure roller. If it is damaged, replace the fuser.
Fuser delivery sensor or sensor lever is defective.	Make sure the fuser delivery sensor lever moves smoothly and is set in place. Replace the lever if it is damaged. Replace the sensor if it is defective.
Fuser delivery roller is worn.	Replace the fuser.
Fuser delivery roller drive gears are worn or damaged.	Replace the fuser.
Face-down delivery roller is defective.	Replace the fuser.
DC controller PCB is defective.	Replace the DC controller PCB. Calibrate the printer after replacing the DC controller. See "Calibrate Now" on page 294.

Jams in the duplex path

Table 7-11 Causes for jams in the duplex path

Cause	Solution
Oblique rollers are worn or damaged.	Replace the oblique rollers.
Oblique roller drive gears are worn or damaged.	Replace the ETB unit. Calibrate the printer after replacing the ETB. See "Calibrate Now" on page 294.
Duplex feed guide is damaged.	Replace the ETB unit. Calibrate the printer after replacing the ETB. See "Calibrate Now" on page 294.

Paper transport troubleshooting

If media is feeding incorrectly, use the information in this section to identify and resolve the problem.

Multiple pages are fed

Table 7-12 Causes for multiple pages feeding

Cause	Solution
Separation tabs in the cassette are damaged (Tray 2 or Tray 3).	Straighten the tabs on the front corners of the tray, or replace the cassette.
Multi-purpose tray separation pad is worn.	Replace the separation pad assembly.
Multi-purpose tray separation pad has a defective spring.	Make sure the spring is set in place. If the spring is damaged, replace the separation pad assembly.

Paper is wrinkled or folded

To diagnose the cause of wrinkled or folded paper, use the Print/Stop test in the Diagnostics menu. Adjust the stop time so the paper stops before it enters the fuser. Open the ETB. If paper is wrinkled at this stage, use Table 7-14 to diagnose the problem. If paper is *not* wrinkled at this stage, use Table 7-13 to diagnose the problem. See page 291 for more information on the Print/Stop test.

Table 7-13 Causes for wrinkled or folded paper (part one, paper path entrance)

Cause	Solution
Registration shutter is defective.	Make sure the registration shutter is clean and moves smoothly. If the registration shutter is worn or damaged, replace the paper pickup assembly.
Feed roller or registration roller is dirty or defective.	Replace the paper pickup assembly.
Paper path has foreign substances or dirt.	Remove any foreign substances or dirt from the paper path. If the feed guide is damaged, replace the paper pickup assembly.
Cartridge shutter open/close mechanism is damaged. (This applies to jams in which paper is crumpled into an accordion fold somewhere on the ETB belt.)	The shutters in each print cartridge should open as you close the ETB. If a shutter does not open, replace that print cartridge. Also check for a damaged shutter mechanism in the printer.

Table 7-14 Causes for wrinkled or folded paper (part two, paper path exit)

Cause	Solution
Fuser inlet guide is dirty.	Clean the fuser inlet guide.
Fuser pressure roller is dirty or damaged.	Clean the pressure roller. If the pressure roller is damaged, replace the fuser.
Fuser sleeve is dirty or damaged.	Clean the fuser sleeve. If the fuser sleeve is damaged, replace the fuser.
Fuser delivery roller is dirty.	Clean the fuser delivery roller.

Paper is skewed

Table 7-15 Causes for skewed paper

Cause	Solution
Paper dust or dirt has accumulated in the cassette feed roller or registration roller.	Clean the rollers.
Cassette feed roller and registration roller are worn irregularly.	Replace the paper pickup assembly.
Separation tabs in the cassette are damaged (Tray 2 or Tray 3).	Straighten the tabs on the front corners of the tray, or replace the cassette.
Registration shutter is defective.	Make sure the registration shutter moves smoothly, its spring is in place, and it is clean. If the registration shutter is damaged, replace the paper pickup assembly.

Image formation troubleshooting

The image formation system is the central hub of the printer. During image formation, an image of colored toner is formed and then fused onto the paper. The image formation system consists of the following physical components:

- four laser/scanners
- four print cartridges
- ETB
- fuser

Before beginning image formation troubleshooting, check that the media meets the specifications listed in the *HP LaserJet Printer Family Print Media Guide*.

Print quality problems associated with media

Some print quality problems arise from use of inappropriate media.

- Use paper that meets HP paper specifications. See “Supported media specifications” on page 29.
- The surface of the media is too smooth. Use media that meets HP paper specifications. See “Supported media specifications” on page 29.
- The driver/printer is set incorrectly. Change the paper type setting to **heavy** or **glossy**.
- The media you are using is too heavy for the printer, and the toner is not fusing to the media.
- The transparencies you are using are not designed for proper toner adhesion. Use only transparencies designed for HP Color LaserJet printers.
- The moisture content of the paper is uneven, too high, or too low. Use paper from a different source or from an unopened ream of paper.
- Some areas of the paper reject toner. Use paper from a different source or from an unopened ream of paper.
- The letterhead you are using is printed on rough paper. Use a smoother, xerographic paper. If this solves your problem, consult with the printer of your letterhead to verify that the paper used meets the specifications for this printer.
- The paper is excessively rough. Use a smoother, xerographic paper.

Overhead transparency defects

Overhead transparencies may display any of the image quality problems that any other type of media will cause, as well as defects specific to printing on transparencies. In addition, because transparencies are pliable while in the print path, they are subject to being marked by the media-handling components.

Note

Allow transparencies to cool at least 30 seconds before handling them.

- In the printer driver's **Paper** tab, select **Transparency** as the media type. Also, make sure that the tray is correctly configured for transparencies.
- Check that the transparencies meet the specifications for this printer. See “Supported media specifications” on page 29. For more information, consult the *HP LaserJet Printer Family Print Media Guide*.
- Handle transparencies by the edges. Skin oil on the surface of transparencies can cause spots and smudges.
- Small, random dark areas on the trailing edge of solid fill pages may be caused by transparencies sticking together in the output bin. Try printing the job in smaller batches.
- The selected colors are undesirable when printed. Select different colors in the software application or printer driver.
- If you are using a reflective overhead projector, use a standard overhead projector instead.

Print quality problems associated with the environment






- The printer is operating in excessively humid or dry conditions. Verify that the printing environment is within specifications. See “Environmental specifications” on page 24.

Print quality problems associated with jams

- Make sure that all media is cleared from the paper path.
- The printer recently jammed. Print two to three pages to clean the printer.
- The media does not pass through the fuser causing image defects to appear on subsequent documents. Print two to three pages to clean the printer. However, if the problem persists see the next section.

Print quality troubleshooting pages

Use the built-in print quality troubleshooting pages to help diagnose and solve print quality problems.

1. Press  to enter the `MENUS`.
2. Press  to highlight `DIAGNOSTICS`.
3. Press  to select `DIAGNOSTICS`.
4. Press  to highlight `PQ TROUBLESHOOTING`.
5. Press  to print the pages.

The printer returns to the `READY` state after printing the print quality troubleshooting pages.

Understanding color variations

The printed output might not match the computer screen, and the colors printed on successive pages might not match. While color variations are inherent in this printing method, they can indicate changes in the printing environment, print media, or printer components.

Common causes of color variation

The following list outlines the major causes of color variations between computers, applications, and output devices.

- Halftone patterns produced on monitors and the types of patterns used in the print jobs are different and might cause variations in the printed output.
- The printed output differs from the image on the monitor because the monitor and the print media have different reference values of black and white. The monitor screen has charcoal gray for the black level, and the white on the monitor screen is actually blue. Black on the print media is limited only by the fill capability of the printer, and most good quality paper has a very high white level. In addition, phosphor (used in color monitors) and toner have entirely different spectra characteristics and different color-rendering capabilities. Differences between output are common. Blues generally match better than reds.
- The color of the ambient light changes the perception of color. Fluorescent light lacks many colors present in incandescent light, and the color range of natural light is broader than any artificial light. When comparing color, choose a standard light source for reference and understand that the perceived color will change as the light changes.
- Long-term color variations occur as paper ages. Use high-quality paper and protect the paper from sunlight to help minimize discoloration.
- Environmental changes can cause color variation. The development process places a high potential across an air gap to attract toner to the imaging drum. Changes in relative humidity vary the point at which the toner travels to the imaging drum.
- All consumable components have a finite life span. As these components reach the end of their useful life, their ability to produce consistent print quality diminishes.
- Paper roughness can cause colors to look different. Use standard paper.

Color selection process

The user selects the color in the application, but the operating system might convert or modify some characteristics of the color before sending the information to the printer driver. The printer driver might also modify color characteristics depending upon the selected output mode.

Any color characteristics not addressed by the printer driver or applications are set to the printer default. The default color might not match the color the user selected.

Matching colors

PANTONE®* color matching

PANTONE®* has multiple color matching systems. PANTONE®* Matching System is very popular and uses solid inks to generate a wide range of color hues and tints.

Swatch book color matching

The process for matching printer output to preprinted swatch books and standard color references is complex. In general, you can obtain a reasonably good match to a swatch book if the inks used to create the swatch book are cyan, magenta, yellow, and black. These are usually referred to as process color swatch books.

Some swatch books are created from spot colors. Spot colors are specially created colorants. Many of these spot colors are outside of the gamut of the printer. Most spot color swatch books have companion process swatch books that provide CMYK approximations to the spot color.

Most process swatch books will have a note on what process standards were used to print the swatch book. In most cases they will be SWOP, EURO, or DIC. To get optimal color matching to the process swatch book, select the corresponding ink emulation from the printer menu. If you cannot identify the process standard, use SWOP ink emulation.

Using color

HP ImageREt 2400

HP ImageREt 2400 is a technology that provides you with the best color print quality without having to change driver settings or make trade-offs between print quality, performance, and memory. ImageREt 2400 produces photorealistic images.

ImageREt 2400 provides 2400 dpi color laser-class quality through a multilevel printing process. This process precisely controls color by combining up to four colors within a single dot and by varying the amount of toner in a given area. As a result, ImageREt 2400, together with the 600-by-600 dpi engine resolution, creates millions of smooth colors.

Paper selection

For the best color and image quality, select the appropriate media type from the printer menu or from the front panel.

sRGB

Standard red-green-blue (sRGB) is a world-wide color standard originally developed by HP and Microsoft as a common color language for monitors, input devices (scanners, digital cameras), and output devices (printers, plotters). It is the default color space used for HP products, Microsoft operating systems, the World Wide Web, and most office software sold today. sRGB is representative of the typical Windows PC monitor today and the convergence standard for high-definition television.

The latest versions of Adobe PhotoShop, CorelDRAW™, Microsoft Office, and many other applications use sRGB to communicate color. Most importantly, as the default color space in Microsoft operating systems, sRGB has gained broad adoption as a means to exchange color information between applications and devices using a common definition that assures typical users will experience greatly improved color matching. sRGB improves your ability to match colors between the printer, the PC monitor and other input devices (scanner, digital camera) automatically, without the need to become a color expert.

Color options

Color options enable optimal color output automatically for diverse types of documents.

Color options use object tagging, which allows optimal color and halftone settings to be used for different objects (text, graphics, and photos) on a page. The printer driver determines which objects are used on a page and uses halftone and color settings that provide the best print quality for each object. Object tagging, combined with optimized default settings, produces great color out of the box.

In the Windows environment, the **Automatic** and **Manual** color options are on the **Color** tab in the printer driver.

Setting color options to **Automatic** will typically produce the best possible print quality for color documents. However, there may be cases when you want to print a color document in grayscale (black and white) or wish to change one of the printer's color options.

- Using Windows, print in grayscale or change the color options using settings found on the **Color** tab in the printer driver.
- Using a Macintosh computer, print in grayscale or change the color options using the **Color Matching** pop-up menu in the **Print** dialog box.

Print in Grayscale

Selecting the **Print in Grayscale** option from the printer driver prints a document in black and white. This option is useful for previewing preliminary copies of slides and hardcopy output, or for printing color documents that will be photocopied or faxed.

Automatic or manual color adjustment

The **Automatic** color adjustment option optimizes the neutral gray color treatment, halftones, and edge enhancements used for each element in a document. For more information, see your printer driver online Help.

Note

Automatic is the default setting and is recommended for printing all color documents.

The **Manual** color adjustment option allows you to adjust the neutral gray color treatment, halftones, and edge enhancements for text, graphics and photographs. To access the Manual color options, from the **Color** tab, select **Manual**, then **Settings**.

Manual color options

Manual color adjustment allows you to adjust the Color (or Color Map) and Halftone options individually for text, graphics, and photographs.

Note

Some applications convert text or graphics to raster images. In these cases, the **Photographs** settings will also control text and graphics.

Halftone options

Halftone options affect the resolution and clarity of your color output. You can select halftone settings for text, graphics, and photographs independently. The two halftone options are **Smooth** and **Detail**.

- The **Smooth** option provides better results for large, solid-filled print areas. It also enhances photographs by smoothing out fine color gradations. Choose this option when uniform and smooth area fills are top priority.
- The **Detail** option is useful for text and graphics that require sharp distinctions among lines or colors, or images that contain a pattern or a high level of detail. Choose this option when sharp edges and details are top priority.

Neutral Grays

The **Neutral Grays** setting determines the method used for creating gray colors used in text, graphics, and photographs.

Two values are available for the **Neutral Grays** setting:

- **Black Only** generates neutral colors (grays and black) using only black toner. This guarantees neutral colors without a color cast.
- **4-Color** generates neutral colors (grays and black) by combining all four toner colors. This method produces smoother gradients and transitions to non-neutral colors, and it produces the darkest black.

Edge Control

The **Edge Control** setting determines how edges are rendered. Edge control has two components: adaptive halftoning and trapping. Adaptive halftoning increases edge sharpness. Trapping reduces the effect of incorrect color plane registration by overlapping the edges of adjacent objects slightly.

Four levels of edge control are available:

- **Maximum** is the most aggressive trapping setting. Adaptive halftoning is on for this setting.
- **Normal** is the default trapping setting. Trapping is at a medium level and adaptive halftoning is on.
- **Light** sets trapping at a minimal level, and adaptive halftoning is on.
- **Off** turns off both trapping and adaptive halftoning.

RGB Color

Two values are available for the **RGB Color** setting:

- **Default** instructs the printer to interpret RGB color as sRGB. sRGB is the accepted standard of Microsoft and the World Wide Web Organization (www).
- **Device** instructs the printer to print RGB data in raw device mode. To render photographs properly with this selection, you must manage image color in the application or operating system.














Adjusting color balance

This printer features automatic color calibration to provide high-quality color output. In situations that require critical color control, you can manually adjust the density balance of the printer's four toner colors. The available range for each color is from -5 to +5. The default value is 0.

CAUTION

This procedure should only be performed by your network administrator. Performing this procedure changes the color balance of the printer by altering halftones and affects *all* print jobs.

To adjust color density

- 1 Press  to enter the MENUS.
- 2 Press  to highlight CONFIGURE DEVICE MENU.
- 3 Press  to select CONFIGURE DEVICE MENU.
- 4 Press  to highlight PRINT QUALITY.
- 5 Press  to select PRINT QUALITY.
- 6 Press  or  to highlight ADJUST COLOR.
- 7 Press  or  to highlight the desired color.
- 8 Press  or  to highlight the correct density setting.
- 9 Press  to select the density setting.
- 10 Press  to set the density for the next color.
- 11 After setting the density for each color, press [PAUSE/RESUME](#).