



hp LaserJet printer family



print media guide

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Overview

HP LaserJet printers quickly and quietly produce documents of excellent print quality. A variety of print media, including paper, envelopes, labels, and overhead transparencies, can be used in your HP LaserJet printer. However, to ensure consistent performance and long-term reliability, the print media must be designed for use with laser printers. Many choices of high-quality print media are available to laser printer users.

This manual provides guidelines for selecting and using print media to help you get the best performance from your HP LaserJet printer. It also contains information to help troubleshoot HP LaserJet printer problems that might be caused by poor-quality print media.

You might encounter some terms that are unfamiliar to you. For more information about these terms, see the glossary in Appendix C on page 39.

The standards discussed in this manual *do not* apply to paper that is being scanned, copied, or faxed through the scan path on an HP LaserJet MFP (multifunction peripheral). Check the individual product manuals for that information.

Note

This document does not support HP LaserJet 2686A, HP LaserJet Plus, HP LaserJet 500, or HP LaserJet 2000 printers. See the user guide for each printer for information about print-media specifications.

Note

When HP LaserJet printers are discussed in this guide, the information pertains to HP Monochrome LaserJet printers, HP color LaserJet printers, and HP LaserJet MFPs unless otherwise noted. For specific information about what media your printer or MFP supports, see the documentation that came with your product.

How HP LaserJet printers work

HP LaserJet printers use laser and electrophotographic technologies. To print a page in a laser printer, the print media must be picked from the input tray one sheet at a time and transported through the paper path. While passing through the paper path, a scanning laser beam writes an electrostatic image onto a rotating photosensitive drum. As this image passes the developing station, a dry, powdery toner is attracted to the image areas. In an HP color LaserJet printer, this process is similar for each of the four toner colors.

The developed image then advances to the transfer station, where the drum contacts the paper or other print media and the toner image is electrostatically transferred onto the paper. After transfer, the print media passes through the fuser, where heat and pressure are applied and the toner fuses (melts) onto the print media. The print media is then delivered to the output bin, ready for use.

To summarize, to create the printed image the print media must be transported through the printer, charged electrostatically, and heated. This is why print media properties such as cleanliness, electrical resistivity, caliper, finish, moisture content, and stiffness can affect the print quality and media-handling performance of your HP LaserJet printer.

Alternative sources of information

The media manufacturer and vendor can provide you with information about the suitability of print media for an HP LaserJet printer.

If you have tried the suggestions that are outlined in this document and in your user guide and you still need assistance, call the dealer from whom you purchased your printer. You can also obtain support through the worldwide network of HP Sales and Service Offices. (See the sales and service listings that are contained in any HP LaserJet printer user guide.)

Visit HP's website at <http://www.hp.com> to find out more about your HP printer and HP print media.

2 Guidelines for using media

HP LaserJet printers are designed to be flexible in the types of print media they can use. However, it is advisable to use good-quality media, and, specifically, HP paper that is designed to work with your HP LaserJet printers (see [“Ordering HP print media” on page 35](#)). This section is designed to help you select media that works best with your HP LaserJet printer.

HP LaserJet printers can also use non-HP brand media that falls within the specifications for supported media. Using non-HP brand media will not typically damage the printer or void the warranty if the media meets those specifications.

Note

Properties of non-HP brand media, over which Hewlett-Packard has no control, are subject to change. The customer assumes all responsibility for the quality and performance of media. Although testing media helps to characterize its performance, long-term satisfaction requires manufacturer process-quality control as well as proper handling and storage by the customer.

If you are planning a large purchase of print media, first print a small quantity in your printing environment. Subject the print media to the temperature, humidity, and printing applications in which the print media will be used. Hewlett-Packard recommends that you ask your print media vendor for a guarantee that its print media will perform satisfactorily in your HP LaserJet printer and that the vendor will assume responsibility for the replacement of any print media that does not print acceptably.

Note

Hewlett-Packard recommends testing print media before purchasing large quantities.

Using print media

This section contains information about the following activities:

- Preparing print media for use
- Using paper
- Using envelopes
- Using labels
- Using overhead transparencies
- Printing on both sides of the paper
- Preparing laser-printed mailings

Preparing print media for use

After purchasing print media, you might have to prepare it for use. Print media needs some time to stabilize in a new environment. To prepare print media, keep it in its protective packaging and store it in the environment in which it will be used. For small quantities, such as one or two reams, store the print media for one to two days. For larger quantities or if the change in the environment is significant, a week or more might be needed.

If print media is not properly prepared, the edges in the ream can become wavy or the sheets might curl soon after the package is opened.

Using paper

“Plain paper” is an inaccurate term. All papers are designed and manufactured for a specific use. Papers that are designed for the electrophotographic process that laser printer and copy machines use are usually called laser- or copier-grade papers. High-quality laser and copier papers are usually made from 100 percent chemical wood pulp and are characterized by a smooth surface, controlled electrical properties, heat stability, and cleanliness. These characteristics ensure good image transfer, fusing without excessive curl, and reliable printer operation.

Note

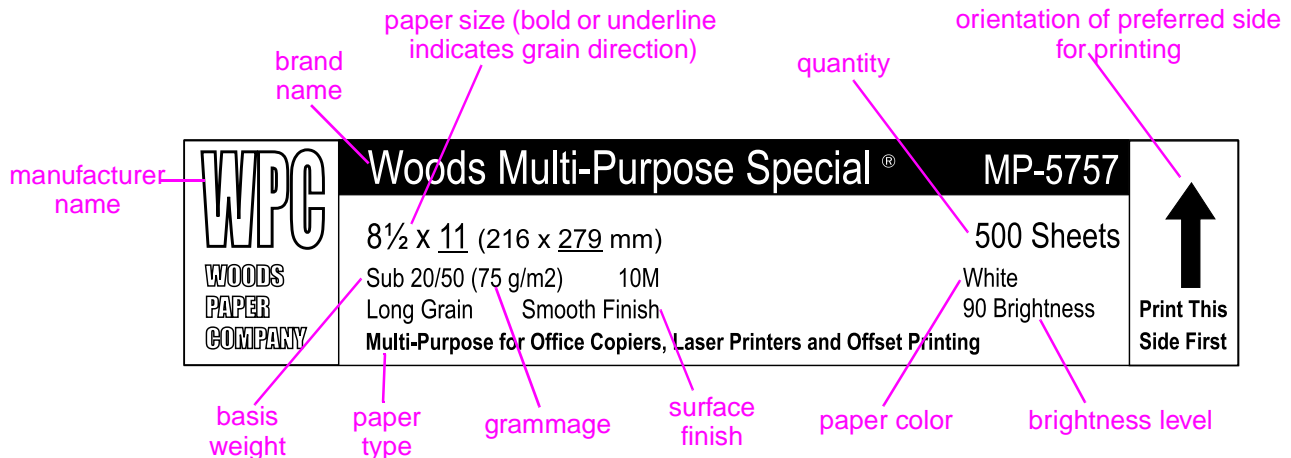
Paper is being produced with higher filler levels, and the small particulate that is used for the fillers (such as calcium carbonate, clay, or talc) must be properly bound or sealed in the sheet during the paper-making process to prevent contamination of the printer. For more information, see [“Coated paper” on page 6](#).

Some print jobs require a paper that has a more prestigious look or feel. Letterhead papers generally have a watermark and often use cotton fiber. These papers tend to have a rougher surface, and their properties might not be controlled as well as those of photocopier papers. Although your HP LaserJet printer will print black satisfactorily on many of these bond papers, using this type of paper with an HP color LaserJet printer can degrade color print quality. However, paper manufacturers are now making laser-grade bond papers, which have properties that are optimized for laser printing.

Reading a ream label

A ream label is typically placed or printed on the outside of the paper wrapping. The ream label usually lists the weight, size, quantity of sheets, grain direction, and other information. The preferred side for printing might be indicated by an arrow on the ream label, although some manufacturers do not specify a print side. Paper should be loaded into the printer so that the indicated side will be printed (or printed first for duplexing). The preferred side might face-up or face-down in the input tray, depending on the printer model and the input source. (See the support documentation for your printer model to determine the orientation in the input tray.)

The following illustration shows an example of a ream label. For more information about the items on the label, see the glossary in Appendix C on page 39.



Opening and loading paper

Follow this suggested process when you open paper and load it into the printer input tray:

- 1 Place the wrapped ream of paper on a flat surface, with the seam side up.
- 2 Read the ream label that is located on the outside of the paper wrapping and note the direction of the arrow that indicates the preferred print side (if one is included). (See "Reading a ream label" on page 5.)
- 3 Open the paper wrapping and inspect for any damage to the sheets such as bent corners, wrinkles, nicked edges, or glue contamination. Discard any damaged sheets.
- 4 Handle the open stack of paper as little as possible. However, before loading the paper into the tray, flex the stack in both directions to "break" any locked edges. Do not fan or separate the paper into several stacks because doing so creates air pockets between the sheets that can cause jams or multiple-sheet feeds.

Paper types

This section describes the following paper types:

- Archival paper
- Bond paper or letterhead
- Coated paper
- Colored paper
- Copier paper (plain paper)
- Embossed and debossed paper
- Glossy paper
- Heavy paper, cover paper, and cardstock
- Laser paper
- Preprinted forms and letterhead
- Recycled paper
- Special print media

Archival paper

Paper that is used for archiving must meet the same specifications as standard paper; however, the pH should be greater than 7.0. Some archival demands are more stringent than others, requiring a specific degree of alkalinity and chemical stability. Toner is chemically stable and should last as long as the paper does. Toner can be degraded by petroleum-based solvents or plasticizers, such as those found in vinyl folders.

Avoid folding archival documents across printed areas or handling archival documents roughly. Discuss archival requirements with your paper supplier.

Bond paper or letterhead

Bond paper or letterhead is premium paper that is often watermarked, sometimes uses cotton fiber, and is available in a wide range of colors and finishes with matching envelopes. Many manufacturers now design these grades of paper with properties optimized for laser printing and advertise the paper as laser compatible or laser guaranteed. Some of the rougher surface finishes, such as cockle, laid, or linen, might require the special fuser modes that are available on some printer models in order to achieve adequate toner adhesion. For more information about your printer's specifications, see the support documentation that came with your printer.

Coated paper

Clay- or other pigment-coated papers must be specifically designed for laser printers. The electrical properties must be controlled and the surface designed not to blister during fusing. The coating must not flake or shed particles that can contaminate the printer.

Some chemically coated papers, such as carbonless paper, can cause swelling of rollers, damage to the paper path, or buildup on the fuser, and can produce undesirable emissions. These papers can result in unsatisfactory performance and poor reliability, and HP does not recommend their use.

Colored paper

You can use colored paper in your HP LaserJet printer if the paper meets the same specifications as standard paper (see [“Guidelines for using paper” on page 9](#)).

Print quality from the HP color LaserJet printers is optimal when printing on white paper. You also can use an HP color LaserJet printer to print on colored paper that meets all of the specifications that are listed in this guide. However, colored paper can change the appearance of the printed colors. This is because HP color LaserJet printers create colors by printing a pattern of dots, overlaying and varying their spacing to produce various colors. When these colors are printed on colored media, the shade or color of the media will vary the shades of your printed colors. Because the printer cannot sense the color of the paper that you are using, it cannot adjust the output colors for colored paper. To manually adjust the output colors, see the support documentation for your printer.

Copier paper (plain paper)

Although copier paper is often referred to as "plain," the paper is optimized to work well with the electrophotographic process that is used in photocopiers and laser printers. Copier-grade paper commands the largest volume for printing and copying, and can be relatively inexpensive. However, keep in mind that the quality and consistency of paper can vary depending on the materials, processes, and controls that the manufacturer uses. These variations can significantly affect the quality of the printed output.

A very inexpensive paper might not save you money if it frequently causes multiple-sheet feeds or jams, or if it causes print-quality problems. If you are having these types of problems, you might want to consider using a different paper type or brand.

Embossed and debossed paper

Avoid heavily embossed or debossed papers to prevent multiple-sheet feeding that results from nesting. In addition, do not print closer than 15 mm (0.59 inch) from the embossment to prevent poor print quality and fusing (toner adhesion). The heat of the fuser can tend to flatten the embossed or debossed images.

Glossy paper

Glossy paper is a coated paper that is manufactured with a very smooth finish so that light is reflected off of the surface of the paper, rather than diffused.

Heavy paper, cover paper, and cardstock

Heavy paper generally refers to paper that is greater than 105 g/m² in weight (heavier than 28-lb bond) and cardstock generally refers to paper that is greater than 163 g/m² in weight (heavier than 60-lb cover, or 90-lb index). The heavier weight of these papers gives them more stiffness, which can degrade feeding reliability (typically as a result of poor pickup from the input tray). Using short-grain heavy paper in printers that feed in the portrait direction might help to avoid feed problems, because the paper is less stiff in the short-grain direction. Also, using the straightest paper path in your printer might also improve feeding reliability and print quality. Heavy paper and cardstock might also require higher fuser temperatures to adequately anchor the toner onto the surface.

CAUTION

Different HP LaserJet printer models and their input trays support various ranges of paper weights. Some models provide optimized settings that are available in the printer driver or at the control panel. Please see the support documentation that came with your HP LaserJet printer for specific information about its capabilities and settings.

Laser paper

Laser paper is another premium-quality paper grade that is typically characterized by very smooth and uniform surfaces, excellent formation, heavier bond weights of 24 lb or 32 lb, and very high brightness and whiteness. These optimized properties can enhance color and monochrome halftone reproductions by providing a very uniform substrate for image transfer and fusing. However, no standards exist for "laser paper," so evaluate a specific brand to make sure that it has the qualities and performance you want.

Preprinted forms and letterhead

To avoid problems when using preprinted forms, embossed paper, and letterhead paper, observe the following guidelines:

- Avoid using low-temperature inks (the kind used with some types of thermography).
- Use forms and letterhead paper that have been printed by offset lithography or engraving.
- Use forms that have been created with heat-resistant inks that will not melt, vaporize, or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers). Typically, oxidation-set or oil-based inks meet this requirement.
- When the form is preprinted, be careful not to change the moisture content of the paper, and do not use materials that change the paper's electrical or handling properties. Seal the forms in moisture-proof wrap to prevent moisture changes during storage.
- Avoid processing preprinted forms that have a finish or coating.
- Avoid using heavily embossed or raised-letterhead papers.
- Avoid papers that have heavily textured surfaces.
- Avoid using offset powders or other materials that prevent printed forms from sticking together.

Recycled paper

Recycled paper is a combination of unused fibers and pre- and post-consumer waste paper. Printed waste paper is usually washed to remove most of the inks and other contaminants. A recycled sheet of paper might contain dark specks or appear gray or dirty. Choose recycled paper that meets the same specifications as standard paper (see ["Guidelines for using paper" on page 9](#)) and that has a suitable appearance for your needs. Hewlett-Packard recommends that recycled paper contain no more than 5 percent groundwood. Hewlett-Packard has tested a variety of recycled copier papers on HP LaserJet printers and has found that they perform similarly to virgin-fiber grades.

Special print media

Paper that undergoes converting processes before it is used in your laser printer must be properly designed and manufactured to ensure acceptable performance. Converting processes include preprinting, engraving, die-cutting, perforating, folding, gluing, embossing, and debossing. Because these processes use many different inks, materials, tools, and techniques, HP recommends that you make sure your converter or supplier knows that the media will be used in a laser printer. Ask for a guarantee of acceptable performance.

Media that has perforations or cutouts can be printed successfully on your HP LaserJet printer. However, such media must be properly designed and manufactured to avoid feed or contamination problems and to avoid wear on the printer.

Cutout: The area where material has been removed by punching or die-cutting. Cutouts can interact with paper-path sensors or can result in contamination from toner if printing is too close to a cutout location.

Perforations: A series of holes or slits in media that provide a controlled tear for separating one portion of the sheet from another. Hewlett-Packard recommends that micro-perfs be used, because they provide better strength and reduce nesting, debris, and dusting.

The following guidelines should be considered when working with a knowledgeable vendor to develop media that will have perforations or die-cuts:

- So that edge trimmings will not scratch the photosensitive drum, punch cutouts and perforations from the side to be printed.
- Round all corners of a cutout to prevent snagging or, in the case of labels, peeling.
- Ensure that die-cutting of labels does not penetrate the liner sheet.
- Ensure that cutouts are not made at a position where paper-path sensors are located.
- Some printers do not support printing closer than 10 mm (0.4 inch) to a cutout edge or perforation in order to avoid toner contamination. For more information about your printer's specifications, see the support documentation that came with your printer.
- All cuts should be clean (no burrs) and free of edge rollover to prevent nesting, poor feeding, contamination, or wear on the printer.
- Orient perforations in the direction of paper feeding to minimize tenting or feeding problems from reduced stiffness.
- Do not run perforations closer than 2 mm (0.08 inch) from the paper edge or 25 mm (1 inch) from the leading edge, or jamming and feeding problems can result.

Guidelines for using paper

Use conventional white copier paper for most printing. The paper should be of high quality and free of the following defects:

- cuts
- tears
- grease spots
- loose particles
- dust
- wrinkles and voids
- curled or bent edges

CAUTION

Avoid using extremely heavy or light paper. Use paper that is within your printer's specified basis-weight range, as shown in the support documentation that came with your printer.

The following table summarizes the guidelines that provide the best performance when using paper.

Note

The specifications that are listed in this table generally apply to all HP LaserJet printers. See the support documentation that came with your printer for product-specific information.

Property	Specifications
Basis weight	64 g/m ² to 105 g/m ² (17 lb to 28 lb). See the support documentation that came with your printer for specific information.
Caliper	0.09 mm to 0.17 mm (3.5 mil to 6.5 mil). See the support documentation that came with your printer for specific information.
Minimum stiffness	1.2 minimum (Taber) machine direction. 0.8 minimum (Taber) cross direction.
Grain	Portrait feeding: long grain up to 135 g/m ² (36 lb); short grain for weights greater than 135 g/m ² . Landscape feeding: long grain.
Electrical surface resistivity	10 ⁹ to 10 ¹³ ohms/square.
Electrical volume resistivity	10 ⁹ to 10 ¹⁴ ohms - cm.
Surface roughness	100 to 190 Sheffield optimal; Up to 350 Sheffield extended (fusing or feeding performance can be degraded at outer ranges).
Fusing compatibility	Must not scorch, melt, ignite, offset materials, or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers).
Furnish (composition)	100 percent chemical pulp and/or cotton content; recycled paper with up to 5 percent groundwood can be used.
Dimensional accuracy	Cut sheet within ±0.80 mm (±0.03 inch) of nominal.
Cut edge quality	Cuts must be smooth and clean with no fray or edge roll.
Curl	Must lie flat within 5 mm (0.2 inch).
Moisture content	4 percent to 6 percent by weight.
Packaging	Moisture-proof ream wrap.
Wax pick	12 minimum (Dennison).

Using envelopes

CAUTION

Early models of the HP color LaserJet printer and HP color LaserJet 5 printers do not support envelopes. Printing on envelopes can damage the printer. See the user guide that came with your printer for detailed instructions about printing on envelopes.

Most HP LaserJet printers can print on many sizes and styles of envelopes by using the manual feed feature, an optional envelope tray, an optional envelope feeder, or another tray. Whichever input method you use, envelopes should meet all of the specifications that are discussed in this document. Your envelope vendor should provide you with a satisfactory envelope that complies with the specifications listed in ["Guidelines for using envelopes" on page 13](#). However, inconsistencies in folds or other process-control problems can result in some envelopes feeding well and others jamming. Purchase envelopes that have the quality and consistency that your printer requires.

Note

Envelopes can meet the general specifications listed in ["Guidelines for using envelopes" on page 13](#) and still not print satisfactorily because of the printing environment or other variables over which HP has no control.

CAUTION

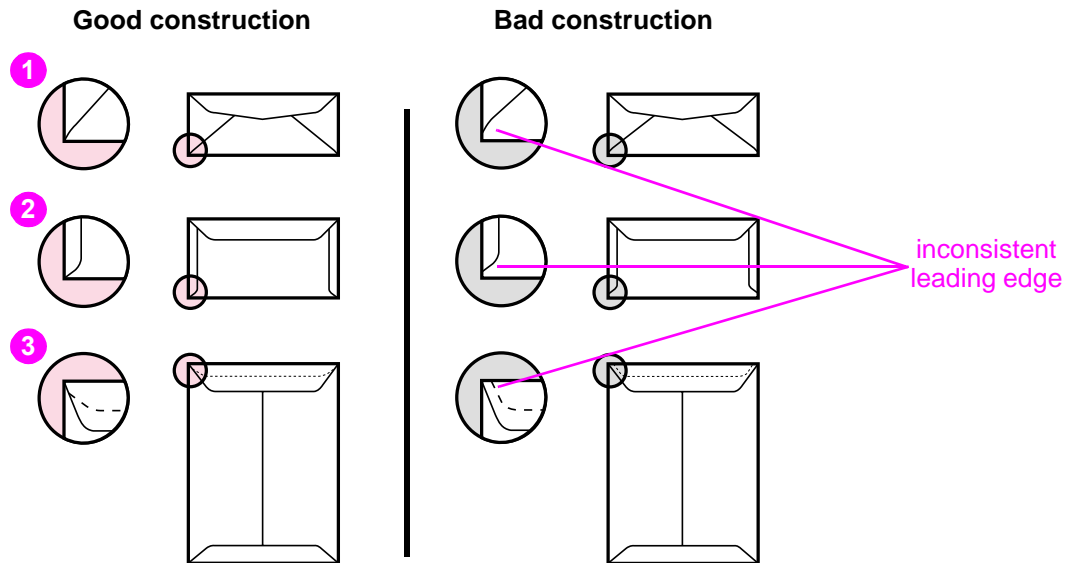
Envelopes containing windows, clasps, or snaps can cause severe damage to the printer. See the support documentation for your printer before using envelopes in your HP LaserJet printer.

Envelope construction

Because of their construction, some envelopes do not feed through the printer dependably. Observe the following guidelines when purchasing and using envelopes:

- Make sure that the envelope's leading edge, which enters the printer first, is straight, with a sharp, well-creased fold that has no more than two thicknesses of paper. Envelopes that exceed 90-g/m² (24-lb) basis weight can cause jamming.
- Avoid using flimsy envelopes that have thick or curved leading edges; they will not feed reliably.
- Envelopes should lie flat and should not be wrinkled, nicked, or otherwise damaged.
- Avoid envelopes that have baggy construction; they might wrinkle while passing through the printer's fuser area.
- Make sure that the adhesive labels and all other materials used on envelopes will not scorch, melt, offset, or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers).
- Avoid using envelopes that have encapsulated adhesives that do not require moistening but instead use pressure for sealing.
- Do not use envelopes that have clasps, snaps, tie strings, transparent windows, holes, perforations, or cutouts.
- Do not use envelopes that have any adhesive surfaces exposed to the printer.
- Use of envelopes that have woven or smooth finishes is recommended to ensure good toner adhesion.

Many envelopes will feed through your HP LaserJet printer without problems. However, some envelope constructions (as shown in the following figure) might not feed reliably. Problems can occur when the envelopes are folded more tightly than normal, which creates a thick leading edge near a corner. Inconsistencies in folding during manufacturing can cause some envelopes to feed well and others to jam. Purchase envelopes that have the quality and consistency that you require.



- 1 Diagonal-seam envelope
- 2 Double-sided seam envelope
- 3 Manila envelope

Summary of HP envelope testing

Hewlett-Packard tests many types of envelopes to determine which ones print acceptably in an HP LaserJet printer. Some of the test results are listed here.

- Commercial or Official envelopes (also called Business or Regular), which have diagonal seams and standard gummed flaps, performed the most reliably.
- Envelopes that have double-sided seam construction, which creates vertical seams at both ends of the envelope instead of diagonal seams, tend to be more flimsy than diagonal-seam envelopes. Double-sided seam envelopes tend to jam or wrinkle unless the edges are thin and sharply creased. However, a variety of double-sided seam envelopes have performed acceptably during testing.
- Envelopes that have a peel-off adhesive strip, or that have more than one flap that folds over for sealing, must use adhesives compatible with the heat and pressure of the printer's fusing process. Many varieties of this type of envelope performed satisfactorily in HP testing; however, the extra flaps and strips can result in increased jamming or wrinkling.
- Generally, feeding problems increase with envelope size. Larger envelope sizes (C5, B5) cannot have a basis weight greater than 105 g/m² (28 lb).
- Rougher finishes such as laid, linen, or cockle can result in poor fusing.
- The multiple layers in envelopes construction might result in a noticeable background effect (small toner particles scattered in the non-imaged areas). You can reduce this effect by increasing the toner density setting on your printer.

Guidelines for using envelopes

The following table summarizes the envelope specifications that provide the best performance. Envelopes should meet the specifications for paper unless otherwise indicated.

Note

The specifications listed in this section generally apply to all HP LaserJet printers. See the support documentation that came with your printer for product-specific information.

Property	Specifications
Basis weight	64 g/m ² to 105 g/m ² (17 lb to 28 lb). See the support documentation that came with your printer for specific information.
Caliper	0.09 mm to 0.14 mm (3.6 mil to 5.5 mil) for a single-layer thickness.
Surface roughness	100 to 200 Sheffield.
Fusing compatibility	All inks, adhesives, and other materials that are used in the envelope construction must be compatible with the heat and pressure of the fusing process. Materials must not scorch, melt, ignite, offset materials, or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers).
Dimensional accuracy and construction quality	Envelopes must be folded within ±1 mm (±0.04 inch) of nominal size and have no more than two thickness of paper anywhere along the leading edge. All folds must be sharply creased and construction must be tight (not baggy) to avoid wrinkling. Envelopes must not be stuck together from excess seam adhesive. The envelope flap must lie flat (within 1.5 mm [0.059 inch] over the width where the adhesive is applied).
Curl	Envelopes must lie flat, with no more than 6 mm (0.25 inch) curl across the entire surface.
Moisture content	4 percent to 6 percent by weight.
Grain	Different types of envelope construction might require different grain orientations for best performance, which is left to the discretion of the converter. For more information, see the support documentation that came with your printer.
Packaging	Protective box to prevent edge damage and maintain flatness.

Using labels

Labels are a type of multiple-layer media that typically consists of a face sheet (the printable surface), pressure-sensitive adhesive, and a liner (a carrier sheet coated with a release agent). Labels to be used in your HP LaserJet printer must be specifically designed for laser printers. If labels other than those compatible with laser printers are used, a significant risk exists for labels peeling or for adhesive contamination that can severely damage your printer. All materials in laser label stock must be compatible with the heat and pressure of the fusing process, and must not melt or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers).

CAUTION

Not all HP color LaserJet printers support printing on labels. Please see the support documentation that came with your product to determine if your product supports labels.

Consider the information in this section when selecting label stock.

Guidelines for using labels

The following table summarizes the adhesive-label specifications that provide the best performance. Labels should meet the specifications for paper unless otherwise indicated.

Note

The specifications listed in this section generally apply to all HP LaserJet printers. See the support documentation that came with your printer for product-specific information.

Property	Specifications
Adhesives	<p>Adhesives must not be on any external surfaces of the label before, during, or after printing. Label construction, adhesive release strength, and appropriate die-cutting must prevent labels from peeling off during printing.</p> <p>Different adhesives can provide removable, permanent, or semi-permanent fixing of the face sheet onto the item being labeled. Generally, acrylic-based adhesives are preferred for laser printing because they can be applied in very thin layers to prevent oozing and contamination, and can be made compatible with the heat and pressure of fusing.</p> <p>Improved processes are being developed to minimize adhesive contamination, such as zone coating or stripped matrix. Zone coating recesses the adhesive around the border of a die-cut, and stripped matrix prevents adhesive from oozing between the die-cut labels. The adhesive and liner must provide adequate release strength so that labels will not peel off during printing.</p>
Caliper	The caliper must not exceed 0.23 mm (9.0 mils).
Face sheet	The face sheet is the printable surface on a sheet of adhesive labels and can be made from different materials, including paper, polyester, and vinyl. It is common for a face sheet to be die-cut so that individual shapes can be removed after printing. Polyester and vinyl labels require a topcoat to provide the proper electrical and toner adhesion properties. It is important to purchase labels from a knowledgeable converter who is familiar with these processes and laser printing.
Fusing compatibility	All inks, adhesives, and other materials that are used in the label construction must be compatible with the heat and pressure of the fusing process. Materials must not scorch, melt, ignite, offset materials, or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers).
Liner	The liner is the carrier sheet for the label material. The liner must provide stability for the reliable pickup and transport of the label stock through the printer.
Packaging	The labels should be delivered in moisture-proof wrap to preserve their properties.
Shelf life	The labels should have a minimum shelf life of one year, when stored at 23° C (73° F) and 50 percent relative humidity.

Recommendations

- Regularly inspect your labels after printing for any indication that the label edges are lifting or that adhesive contamination is occurring on the print surface. If either of these problems is observed, HP recommends that you discontinue use of that box or lot-number of labels and discuss the problem with your label supplier.
- If many sheets of labels are being continuously run, periodically run several sheets of paper through the printer to clean any contamination or label-stock adhesive that might have deposited.

CAUTION

Make sure to run full sheets of labels. Reprinting unused portions can increase the risk of the labels peeling and the occurrence of adhesive contamination.

Using overhead transparencies

Overhead transparency film must be designed specifically for use with laser printers. Photocopy transparency film might not be compatible with laser printers because of higher temperature and stiffness requirements. Color laser printers also require different film from that used in monochrome printers to create proper color reproduction and accommodate fusing needs.

Overhead transparency film is very smooth and must have a topcoat to provide the proper electrical and toner adhesion properties. A transparency that is made of incompatible material or that is too thin can easily melt in or wrap around the fuser and damage your printer. The thickness requirement for monochrome overhead transparency film is 0.10 to 0.11 mm (4.0 to 4.4 mils) and for color overhead transparency film is 0.12 to 0.13 mm (4.8 to 5.2 mils).

Overhead transparency materials must be compatible with the heat and pressure of the fusing process. Materials must not discolor, offset, or release undesirable emissions when heated to 205° C (401° F) for 0.1 second (0.4 second for HP color LaserJet printers). See your HP LaserJet printer user guide for detailed instructions about using overhead transparencies.

See ["Ordering HP print media" on page 35](#) for information about ordering HP transparencies.

CAUTION

Not all HP color LaserJet printers support printing on transparencies. Please see the support documentation that came with your product to determine if your product supports transparencies.

Guidelines for using overhead transparencies

The following table summarizes the overhead transparency specifications that provide the best performance.

CAUTION

To prevent jamming or poor-quality output, HP recommends using monochrome transparencies with HP LaserJet monochrome printers and color transparencies with HP color LaserJet printers.

Note

The specifications listed in this section generally apply to all HP LaserJet printers; see the support documentation that came with your printer for product-specific information.

Property	Specifications
Caliper	0.12 mm to 0.13 mm (4.8 mils to 5.2 mils) for HP color LaserJet printers. 0.10 mm to 0.11 mm (4.0 mils to 4.4 mils) for HP monochrome LaserJet printers.
Electrical surface resistivity	10^{10} to 10^{13} ohms/square.
Fusing compatibility	Overhead transparency materials must be compatible with the heat and pressure of the fusing process. Materials must not discolor, melt, offset, or release undesirable emissions when heated to 205° C (401 ° F) for 0.1 second (0.4 second for HP color LaserJet printers).

Printing on both sides of the paper

Two-sided printing, also known as duplex printing or duplexing, can be either an automatic or a manual process.

Note

The print quality for color duplex printing has been optimized for 90-g/m² (24-lb) and heavier paper.

Automatic duplexing

Automatic duplexing requires an HP LaserJet printer that is designed especially for duplex printing. See the support documentation for your printer model or duplex accessory for information about supported paper. (For example, when duplexing on the HP color LaserJet 8500 printer, 90 g/m² to 105 g/m² [24 lb to 28 lb] media is recommended.)

CAUTION

Duplexing on adhesive labels, envelopes, or overhead transparencies can damage your printer.

Manual duplexing

Manual duplex printing, in which sheets that already have been printed are fed again into the printer, requires operator intervention. (See the software application support documentation for more information.) Hewlett-Packard recommends manually refeeding sheets *only* through the manual feed slot, the multipurpose (MP) tray, or tray 1. *Do not* refeed sheets from the paper cassette trays. Using the paper cassette trays can cause jams, misfeeds, and print-quality problems.

Preparing laser-printed mailings

Laser printing technology is being used by more and more postal customers to prepare mailings. Laser printers produce high-quality images; offer advantages in speed, flexibility, and size; and are the printers of choice for smaller companies and in-home businesses.

Unlike offset printers, in which the ink is absorbed into the paper, laser printers use heat to fuse a plastic toner to the surface of the paper. Because of this difference, HP recommends that you use the following guidelines to produce quality laser-printed products for mailings:

- 1 Ensure that the manufacturer's recommended toner is used for the laser printer. Many aftermarket toners do not comply with the manufacturer's original specifications. Hewlett-Packard cannot predict or guarantee the performance of non-HP consumables in HP products.
- 2 Paper selection is critical. Several manufacturers have papers that are specifically formulated for their printers. For specific properties that are required for the paper used for laser-printed mailings, please contact your United States Postal Service business office.
- 3 Avoid preparing laser-printed sheets as folded self-mailers. The laser-printed sheets should be mailed in envelopes. The envelopes should have an edge or end seam and a minimum basis weight of 24 lb (90 g/m²).

- 4 Print bar codes in advance and presort all envelopes. Meter the envelopes or use precanceled stamps. (In addition to helping in the overall performance of the laser-printed document, bar coding and presorting can offer advantageous postal charges. In the United States, please contact your United States Postal Service business office to find out more about this.)
- 5 Avoid text-on-text contact. This can be avoided by printing on only one side, and then folding the document with the fold to the outside. Text then contacts only the inside of the envelope or the back side of the printed sheets. If text-on-text contact cannot be avoided, use a thin insert such as onion skin to separate the printed sheets for best results.
- 6 Ensure that all mailpieces are placed in a tray and presented at the retail window or, in the United States, at the Bulk Mail Acceptance Unit (BMAU). *Avoid placing laser-printed mail into collection boxes or chutes.*

Shipping and storing print media

The performance of HP LaserJet printers depends on the condition of the print media that is used. This section contains recommendations for shipping and storing media, and provides information about environmental effects on media.

Shipping media

When you are shipping print media through different environments, use plastic wrap to wrap all cartons on the shipping pallet. When you are shipping media across bodies of water, also wrap individual cartons. Packaging must protect the media from physical damage.

Storing media

Follow these guidelines when stacking and storing print media:

- *Do not* store cartons or reams directly on the floor. Place cartons on a pallet or on shelves.
- *Do not* store individual reams in a manner that will result in curling or warping.
- Rewrap partially used packages of media before storing them.
- *Do not* stack more than six cartons on top of each other.
- Stack each carton squarely on top of the one underneath.
- Stack each carton upright.
- *Do not* place anything on top of media, regardless of whether the paper is packaged or unpackaged.
- Store envelopes in a protective box to avoid damaging the envelope edges.
- Keep stored media away from extremes in temperature and humidity.
- *Do not* store printed documents in vinyl folders (which can contain plasticizers) and do not expose the documents to petroleum-based solvents.

Environmental considerations

HP LaserJet printers are designed to operate in a wide range of environmental conditions. For best performance, store and use media at 20° to 24° C (68° to 75° F), with a relative humidity of 45 to 55 percent. Follow these guidelines when media is used in an environment outside those temperature and humidity ranges:

- *Do not* expose the media to extremes in humidity or temperature. If media is left unwrapped or in the printer input tray, extreme changes in the environment will cause the media to assume unwanted characteristics.
- In the case of extreme humidity, keep paper and envelopes tightly wrapped in plastic.

If a significant temperature difference exists between the media storage area and the printer's operating environment, allow the media time to adjust to the temperature in the printer's operating environment before unwrapping it. The greater the temperature difference and the greater the amount of media to acclimate, the longer this time period should be. Allow one day for every 10° C (20° F) difference in temperature between the storage environment and the printing environment.

3 Troubleshooting

Print-quality and media-handling problems usually result from print media that does not meet the specifications that are described in this guide, or print media that has been stored improperly or is not in good condition.

The following sections further explain the possible causes of and solutions to print-media problems.

Troubleshooting checklist

Ask the following questions to determine if the print media is causing print-quality problems:

- Does your media meet the specifications outlined in this document? (See [“Types of print media to avoid” on page 22](#) and [“Guidelines for using media” on page 3](#).)
- Is the media in good condition? Is the media bent or wrinkled?
- Are you using the printing procedures that are described in the printer user guide?
- Are you observing correct practices when handling and loading media? (See the support documentation for your printer for guidelines to load media.)
- Are your print-quality problems isolated to a specific type of media?
- Did you check the following aspects of the environment in which the printer operates or in which the print media is stored? See [“Environmental considerations” on page 19](#).
 - temperature
 - humidity
 - cleanliness

Basic troubleshooting

If you cannot determine the cause of your print defects by using information from the troubleshooting checklist, try the following procedures:

- 1 Inspect the print media for obvious defects, such as torn sheets, contamination from glue, or ragged cut edges.
- 1 Use print media from another lot or from a different manufacturer.
- 2 Turn the paper stack over in the input tray, or turn it 180° in the tray. Do both, if necessary.
- 3 If you have a print-quality problem that is related to envelopes, print a sheet of paper to determine if the problem is caused by the variable thickness of your envelope.
 - If the print quality of the single-sheet sample is good, re-examine your envelope and see [“Envelope construction” on page 11](#) for more information.
 - If the print quality of the single-sheet sample is poor, you might have a printer problem. See the support documentation for your printer to see further troubleshooting information.
- 4 Read the remainder of this troubleshooting section for further troubleshooting information, perform the maintenance procedures that are recommended in your printer user guide, or see the troubleshooting section in your printer user guide.

Types of print media to avoid

The following characteristics can affect the performance of your HP LaserJet printer unless the paper or other print media you are using is specifically designed to work with your HP LaserJet printer:

- Print media, media coatings, dyes, or inks that contain materials that melt, vaporize, offset, discolor, or release undesirable emissions when exposed to 205° C (401 ° F) for 0.1 second (0.2 second for HP color LaserJet printers).
- Print media that is very rough, highly textured, or heavily embossed.
- Multipart forms.
- Print media that offsets or discolors.
- Print media that is damaged, curled, wrinkled, or irregularly shaped.
- Print media that has not been stored or shipped properly. (See [“Shipping media” on page 19](#) and [“Storing media” on page 19](#).)
- Overhead transparency film that produces undesirable emissions or melts when exposed to a fusing temperature of 205° C (401° F) for 0.1 second (0.4 second for HP color LaserJet printers).
- Envelopes that have encapsulated adhesives that do not require moistening but instead use pressure for sealing.
- Envelopes that have clasps, snaps, tie strings, windows, or synthetic materials. These materials can severely damage the printer.
- Envelopes that are not square, straight, or constructed correctly. (See [“Envelope construction” on page 11](#).)
- Envelopes of a basis weight less than 60 g/m² (16 lb) or greater than 105 g/m² (28 lb).
- Envelopes that have baggy construction or folds that are not sharply creased.

Paper problems

This section provides information about conditions that can indicate paper problems. These conditions include a high occurrence of jams, a high number of multiple-sheet feeds, and post-image curl.

CAUTION

Do not reuse jammed paper. Doing so can damage the printer.

Frequent paper jams

The following table lists possible causes of frequent paper jams and suggested actions.

Note

To recover from a paper jam, follow the directions that are listed in your HP LaserJet printer user guide.

Cause	Action(s)
Paper is too stiff or heavy. Heavy or stiff paper might not be able to negotiate the paper path or be picked up from the input tray.	<ul style="list-style-type: none">● Make sure that the paper does not exceed the basis weight that is specified in the user documentation for your printer.● Manually feed the paper into the printer.● Use the correct output bin, as shown in your printer user guide.● Use a lighter-weight paper.
Paper is too smooth or too rough.	<ul style="list-style-type: none">● Change the paper type or manually feed the paper into the printer. See your printer user guide for the correct output tray selection.
Paper is not cut to specification. This can cause poor print alignment, misstacking, improper fit in the input tray, or problems with the paper sensors.	<ul style="list-style-type: none">● Change the paper type or try another ream of paper.
Paper is too light or too flimsy.	<ul style="list-style-type: none">● Make sure that the paper meets the specifications that are listed for basis weight in "Guidelines for using paper" on page 9.
Paper guides in the tray are set incorrectly in the printer.	<ul style="list-style-type: none">● Make sure that all of the paper guides have been set correctly. See the user documentation for your printer for more information.
Paper is too dry or too moist.	<ul style="list-style-type: none">● Make sure that the paper is not near a window or a heat or air vent.● Replace the paper in the unit with paper from a newly opened ream.
Paper might contain higher filler levels of talc and calcium carbonate. If the talc or calcium carbonate are not well-bound to the paper fibers, they can build up in the paper path and cause frequent paper jams.	<ul style="list-style-type: none">● Try a different paper brand.● Perform the printer cleaning procedures that are appropriate for your printer. For most HP LaserJet printers you can use a cleaning page to remove build-up in the fuser. For more information, see the documentation that came with your printer.

Frequent multiple-sheet feeds

The following table lists possible causes of frequent multiple-sheet feeds and suggested actions.

Cause	Action(s)
Paper is added in small amounts to the input tray.	<ul style="list-style-type: none">● Add only large amounts of paper to the input tray, and avoid mixing paper types in the input tray.
Paper is too dry or is not moist enough. (Insufficient moisture makes paper less conductive and creates static buildup.)	<ul style="list-style-type: none">● Try another ream of paper.● Change the paper type.● Make sure that the paper is properly prepared. See "Preparing print media for use" on page 4.
Paper is too light or too thin.	<ul style="list-style-type: none">● Change the paper type.
Paper is too smooth or too rough. Surfaces tend to interlock or stick together.	<ul style="list-style-type: none">● Change the paper type.
Paper is embossed or has raised letterhead.	<ul style="list-style-type: none">● Change the paper type.
Paper guides in the trays are set incorrectly.	<ul style="list-style-type: none">● Make sure that all of the paper guides have been set correctly. See the user documentation for your printer for more information.
Paper sticks together at the edges (edgeweld). Edgeweld is caused by the use of dull cutting blades during the manufacturing process.	<ul style="list-style-type: none">● Flex the stack in both directions to "break" any locked edges.● Try a different ream of paper.● Try a paper from a different paper manufacturer.

Reducing post-image curl

When an HP LaserJet printer prints a sheet of paper, the sheet can develop a curvature that is called post-image curl. Generally, the higher the moisture content of the paper, the greater the curl.

Both the paper and the printer affect the amount of post-image curl. In the papermaking process, stresses that can cause curl are a result of the paper manufacturing process, so different papers will have differing amounts of post-image curl. In the printing process, the paper is subjected to the heat and pressure of the fuser as well as to the contours of the paper path.

Cause	Action(s)
Paper is too moist, resulting in waviness or curl.	<ul style="list-style-type: none"> <li data-bbox="855 520 1444 615">● Print to the another output bin, for example, the face-up output bin. (This option is not available with some printers.) <li data-bbox="855 615 1444 646">● Change to a different type or brand of paper. <li data-bbox="855 646 1444 768">● You might need to acclimate the paper to your environment to diminish differences in heat and moisture. (See “Preparing print media for use” on page 4.) <li data-bbox="855 768 1444 863">● Follow the storage and handling specifications in this document. (See “Shipping and storing print media” on page 19.) <li data-bbox="855 863 1444 953">● On HP color LaserJet printers, reduce toner coverage by using dither patterns rather than solid fill.
Paper orientation (direction in which the paper is fed into the printer) is incorrect, resulting in excessive curl.	<ul style="list-style-type: none"> <li data-bbox="855 953 1444 1016">● Turn the paper stack over or turn it around in the input tray to reverse the direction of the paper. <li data-bbox="855 1016 1444 1167">● The grain of the paper can affect the curl of the paper. Therefore, if you are feeding the paper in landscape mode (horizontally) and are experiencing curl, try feeding the paper in portrait mode (vertically), if possible.
Fuser mode is set improperly in the printer driver for the paper that is being used.	<ul style="list-style-type: none"> <li data-bbox="855 1167 1444 1289">● If possible, set the fuser mode to a lower setting. For more information about setting the fuser mode, see the support documentation that came with your printer.

Envelope problems

High rates of jams, gray areas printing on envelopes, or wrinkling can indicate problems with envelopes.

Frequent envelope jams

Overfilling the envelope tray and misadjusting its guides are the most common causes of jams. However, if the envelope tray is properly loaded, the envelopes might be causing the problems.

To recover from an envelope jam, follow the directions that are listed in your HP LaserJet printer user guide.

CAUTION

Do not reuse jammed envelopes. Doing so can damage the printer.

Cause	Action(s)
Envelopes are poorly manufactured.	<ul style="list-style-type: none">● Make sure that the leading edge is straight, and has a sharp, well-creased fold. The envelope must not have more than two thicknesses of paper along any leading edge. The folded layers of paper should come to a point at the leading-edge corners. (See the figure in "Envelope construction" on page 11.)● Purchase envelopes that are manufactured correctly, or run the side of a pen or pencil over the envelope edges to flatten them.
Envelopes are not creased sufficiently to have sharp edges.	<ul style="list-style-type: none">● Crease the leading edge of the envelope with the side of a pen or pencil, or change to a different type or brand.
Envelopes are wrinkled, bent, or curled.	<ul style="list-style-type: none">● Make sure that the envelope's leading edge, which enters the printer first, is straight, and that it has a sharp, well-creased fold that has no more than two thicknesses of paper.
Envelopes are too stiff or heavy. Stiff or heavy envelopes cannot negotiate the paper path or be picked up from the envelope tray.	<ul style="list-style-type: none">● Use a lighter-weight envelope. Do not exceed the basis weight of 105 g/m² (28 lb).● Use the printer's most direct (straight-through) paper path.
Envelopes are too smooth (do not have enough friction for transport) or too rough	<ul style="list-style-type: none">● Change to a different type of envelope.
Envelope is inserted too far into the manual feed slot.	<ul style="list-style-type: none">● Insert the envelope only until you feel a slight resistance.

Gray areas on envelopes

Cause	Action(s)
Envelope has seams or multiple layers.	<ul style="list-style-type: none">● Avoid printing over seams or other multiple-layer areas.
The toner density setting is too light.	<ul style="list-style-type: none">● Reduce background (gray shading in non-imaged areas) by adjusting the toner density setting to a darker setting. See the documentation that came with your printer.

Wrinkling

Wrinkles that form in envelopes after printing usually are caused by the following envelope conditions:

Cause	Action(s)
Loose envelope construction.	<ul style="list-style-type: none">● Try different envelopes that are better constructed. See “Envelope construction” on page 11 for characteristics of good envelope construction.
Folds are not sharply creased.	<ul style="list-style-type: none">● Try different envelopes that are better constructed. See “Envelope construction” on page 11 for characteristics of good envelope construction.
Low-weight/low-strength paper used in the envelope construction.	<ul style="list-style-type: none">● Try different envelopes that are better constructed. See “Envelope construction” on page 11 for characteristics of good envelope construction.
High moisture content.	<ul style="list-style-type: none">● You might need to acclimate the envelope from the storage environment to your environment in order to diminish differences in heat and moisture. (See “Preparing print media for use” on page 4.)

Print-quality problems

The following sections discuss print-quality problems that might be caused by print media.

Background toner particles

If the amount of background particles becomes unacceptable, the following procedures might help to clear the condition:

- Increase the toner density setting. This decreases the amount of background particles.
- Change the paper to a lighter basis weight.
- Check the printer's environment. Very dry (low humidity) conditions can increase the amount of background particles.

Dropouts

If faded-out areas or character voids (partial print) occur randomly on the page:

- The moisture content of the paper might be uneven, or the paper might have moist spots on its surface as a result of environmental humidity. Store the paper in a moisture-proof container. Try removing the top few sheets of paper from the paper tray or use paper from a different source (such as another ream), or try a different brand of paper.
- The paper lot is bad. The manufacturing processes can cause some areas to reject toner. Try a different kind or brand of paper.

Improperly formed or wavy characters

If characters are improperly formed or if the printer is producing hollow images, the paper stock might be too smooth. Try a different paper if characters are improperly formed.

Toner smear

- If toner smears appear on the leading edge of the paper, the paper stock might be too slick. Try a different paper if the toner is smearing on the paper.
- If toner is not fusing properly (and is smearing), try a higher fuser mode setting (if available). For more information, see the support documentation that came with your printer.

Toner specks (background scatter)

Toner specks are black dots that appear randomly on either side of the page. If the toner specks appear, the media might not meet the specifications for your printer (for example, the paper is too moist or too rough). For more information, see the support documentation that came with your printer.

A

Specifications

U.S. paper grades

The U.S. paper-grading system has evolved through custom and usage, resulting in similar papers having differently stated weights. For example, a 24-lb bond paper is exactly the same weight as a 60-lb book paper, or a 60-lb text, or a 33-lb cover. This is because basis weight is defined as the weight of 500 sheets of paper cut to basic size. The basic size for bond, book/text, cover, index, bristol, and tag are all different, so the given weights for these paper grades can be different although the physical weight is virtually identical.

Common paper grades and basis weights

The following table helps clarify differences in weights among paper grades. Note the difference in basic size for each grade, which affects the weight of 500 sheets of that grade.

Paper grade	Basic size	Basic area	Factor	Equivalent basis weights (example)
Bond	17 by 22 inches (432 by 559 mm)	374.0 sq. inches (.241 m ²)	1.00	24-lb bond
Text	25 by 38 inches (635 by 965 mm)	950.0 sq. inches (.613 m ²)	2.54	61-lb text
Book (coated or uncoated)	25 by 38 inches (635 by 965 mm)	950.0 sq. inches (.613 m ²)	2.54	61-lb book
Cover	20 by 26 inches (508 by 660 mm)	520.0 sq. inches (.335 m ²)	1.39	33-lb cover
Bristol	22.5 by 28.5 inches (571 by 724 mm)	641.25 sq. inches (.414 m ²)	1.71	41-lb Bristol
Index	25.5 by 30.5 inches (648 by 775 mm)	777.75 sq. inches (.502 m ²)	2.08	50-lb index
Tag	24 by 36 inches (610 by 910 mm)	864.0 sq. inches (.557 m ²)	2.31	55-lb tag
Metric weight	39.37 by 39.37 inches (1000 by 1000 mm)	1550.0 sq. inches (1.0 m ²)	3.76	90 g/m ²

Weight equivalence table

The following table shows equivalent weights for different grades of paper. A **bolded** value indicates a commonly available standard weight for that grade.

Note

Text and book grades marked with an asterisk (*) actually calculate to 51, 61, 71, and 81 but are rounded to standard book/text weights of 50, 60, 70, and 80.

Bond wt. (17 by 22 inches)	Text/Book wt. (25 by 38 inches)	Cover wt. (20 by 26 inches)	Bristol wt. (22.5 by 28.5 inches)	Index wt. (25.5 by 30.5 inches)	Tag wt. (24 by 36 inches)	Metric wt.
16 lb	41 lb	22 lb	27 lb	33 lb	37 lb	60 g/m²
17 lb	43 lb	24 lb	29 lb	35 lb	39 lb	64 g/m²
20 lb	50 lb *	28 lb	34 lb	42 lb	46 lb	75 g/m²
21 lb	54 lb	30 lb	36 lb	44 lb	49 lb	80 g/m²
24 lb	60 lb *	33 lb	41 lb	50 lb	55 lb	90 g/m²
27 lb	68 lb	37 lb	45 lb	55 lb	61 lb	100 g/m²
28 lb	70 lb *	39 lb	49 lb	58 lb	65 lb	105 g/m ²
29 lb	74 lb	41 lb	50 lb	61 lb	68 lb	110 g/m²
32 lb	80 lb *	44 lb	55 lb	67 lb	74 lb	120 g/m²
36 lb	90 lb	50 lb	62 lb	75 lb	83 lb	135 g/m²
39 lb	100 lb	55 lb	67 lb	82 lb	91 lb	148 g/m ²
40 lb	101 lb	55 lb	68 lb	83 lb	92 lb	150 g/m²
43 lb	110 lb	60 lb	74 lb	90 lb	100 lb	163 g/m ²
45 lb	115 lb	63 lb	77 lb	94 lb	104 lb	170 g/m²
47 lb	119 lb	65 lb	80 lb	97 lb	108 lb	176 g/m ²
51 lb	128 lb	70 lb	86 lb	105 lb	117 lb	190 g/m²
53 lb	134 lb	74 lb	90 lb	110 lb	122 lb	199 g/m ²
54 lb	137 lb	75 lb	93 lb	113 lb	125 lb	203 g/m ²
58 lb	146 lb	80 lb	98 lb	120 lb	133 lb	216 g/m ²
65 lb	165 lb	90 lb	111 lb	135 lb	150 lb	244 g/m ²
66 lb	169 lb	92 lb	114 lb	138 lb	154 lb	250 g/m²
67 lb	171 lb	94 lb	115 lb	140 lb	155 lb	253 g/m ²
70 lb	178 lb	98 lb	120 lb	146 lb	162 lb	264 g/m ²
72 lb	183 lb	100 lb	123 lb	150 lb	166 lb	271 g/m ²

Standard media sizes used in laser printers

The following sections list the English and metric dimensions of the most commonly used paper, envelope, and cardstock sizes. See the support documentation that came with your printer for specific information about the media that your HP LaserJet printer supports. Use only media that is supported.

Paper

Size	English dimension	Metric dimension
Letter	8.5 by 11.0 inches	215.9 by 279.4 mm
Legal	8.5 by 14.0 inches	215.9 by 355.6 mm
Folio/foolscap	8.50 by 13.00 inches	215.9 by 330.2 mm
Executive	7.25 by 10.50 inches	184.2 by 266.7 mm
Tabloid/ledger	11.0 by 17.0 inches	279.4 by 431.8 mm
Ledger full bleed	12.0 by 18.0 inches	304.8 by 457.2 mm
A3	11.69 by 16.54 inches	297 by 420 mm
RA3	12.01 by 16.93 inches	305 by 430 mm
A3 full bleed	12.28 by 17.32 inches	312 by 440 mm
A4	8.27 by 11.70 inches	210 by 297 mm
A5	5.83 by 8.27 inches	148 by 210 mm
B4 (JIS)	10.12 by 14.33 inches	257 by 364 mm
B4 (ISO)	9.84 by 13.90 inches	250 by 353 mm
B5 (JIS)	7.17 by 10.12 inches	182 by 257 mm
B5 (ISO)	6.93 by 9.84 inches	176 by 250 mm
8K	10.63 by 15.35 inches	270 by 390 mm
16K	7.68 by 10.63 inches	195 by 270 mm
32K	5.32 by 7.68 inches	135 by 195 mm

Envelopes

Size	English dimension	Metric dimension
U.S. #6 3/4 (personal)	3.63 by 6.50 inches	92.1 by 465.1 mm
U.S. #8 5/8 (check)	3.63 by 8.63 inches	92.1 by 219.1 mm
U.S. #9	3.88 by 8.88 inches	98.4 by 225.4 mm
U.S. #10 (com10)	4.13 by 9.50 inches	104.9 by 241.3 mm
U.S. #11	4.50 by 10.38 inches	114.3 by 263.5 mm
U.S. #5 1/2 baronial	4.38 by 5.75 inches	111.1 by 146.1 mm
U.S. #6 baronial	4.75 by 6.50 inches	120.7 by 165.1 mm
U.S. #7 3/4 (Monarch)	3.88 by 7.50 inches	98.4 by 190.5 mm
U.S. A2 announcement	4.38 by 5.75 inches	111.1 by 146.1 mm
U.S. A6 announcement	4.75 by 6.50 inches	120.7 by 165.1 mm
ISO B5	6.93 by 9.84 inches	176 by 250 mm
ISO C5	6.38 by 9.02 inches	162 by 229 mm
ISO C5/6	4.49 by 9.02 inches	114 by 229 mm
ISO C6	4.49 by 6.38 inches	114 by 162 mm
ISO DL	4.33 by 8.66 inches	110 by 220 mm

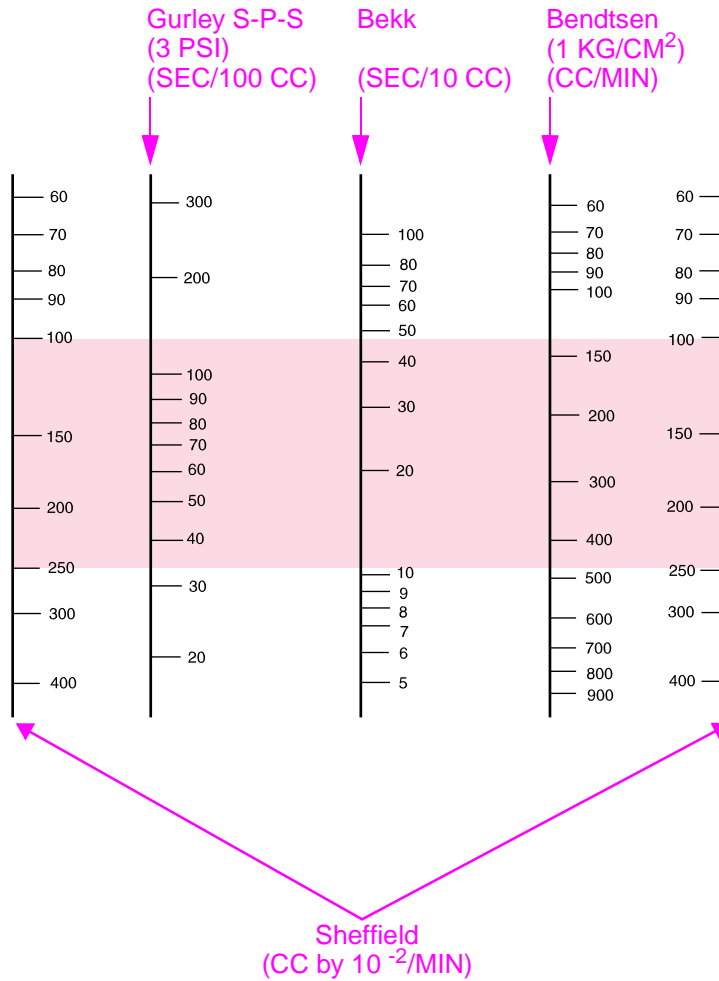
Cardstock

Size	English dimension	Metric dimension
Index card (3x5)	3.00 by 5.00 inches	76.2 by 127 mm
Index card (4x6)	4.00 by 6.00 inches	101.6 by 152.4 mm
Index card (5x8)	5.00 by 8.00 inches	127 by 203.2 mm
U.S. postcard	3.50 by 5.50 inches	88.9 by 139.7 mm
European postcard	4.13 by 5.83 inches	105 by 148 mm
J postcard (hagaki)	3.94 by 5.83 inches	100 by 148 mm
J double postcard (oufuku hagaki)	5.83 by 7.87 inches	148 by 200 mm

Comparisons of paper smoothness

Smoothness is typically expressed in terms of Sheffield, Gurley, Bekk, or Bendtsen units. HP LaserJet printers generally require a smoothness of between 100 and 200 Sheffield.

The following figure compares the different types of smoothness.



B Ordering HP print media

In the United States, you can purchase HP paper and transparencies through HP's website at <http://www.hpshopping.com> or by contacting your local reseller. To order outside of the U.S., please contact your local sales office.

Laser paper

CAUTION

Not all HP LaserJet printers support printing on all of the print media that is listed in the following table. Please see the support documentation that came with your product to determine if your product supports a particular type of print media.

Media	Use with	Use for	Characteristics	HP part numbers
hp office paper	monochrome laser printers	high-volume office printing	75 g/m ² (20-lb bond), 500 sheets, 87 bright	letter (HPC8511) letter, 3-hole prepunched (HPC3HP) legal (HPC8514) 11 by 17 (tabloid) (HPC1117)
hp multipurpose paper	monochrome laser printers	correspondence, memos, and reports	75 g/m ² (20-lb bond), 500 sheets, 90 bright	letter (HPM1120) letter, 3-hole prepunched (HPM113H) legal (HPM1420) 11 by 17 (tabloid) (HPM1720)
hp printing paper	monochrome laser printers	correspondence, reports, and in-house newsletters	83 g/m ² (22-lb bond), 500 sheets, 92 bright	letter (HPP1122)
hp color laser paper	monochrome and color laser printers	newsletters and color documents	90 g/m ² (24-lb bond), 500 sheets, smooth matte finish on both sides, 96 bright	letter (HPL245R) 11 by 17 (tabloid) (HPL2417)
hp color laser paper	monochrome and color laser printers	newsletters and color documents	105 g/m ² (28-lb bond), 500 sheets, smooth matte finish on both sides, 96 bright	letter (HPL285R) 11 by 17 (tabloid) (HPL2817)
hp premium choice LaserJet paper	monochrome and color laser printers	proposals and charts	160 g/m ² (42-lb bond), 250 sheets, matte finish on both sides, 98 bright	letter (HPU1132) 11 by 17 (tabloid) (HPU1732) A4 (Europe) (CHP413) A3 (Europe) (CHP421)

Media	Use with	Use for	Characteristics	HP part numbers
hp LaserJet paper	monochrome and color laser printers	reports, user manuals, letterhead, and correspondence	90 g/m ² (24-lb bond), 500 sheets, matte finish on both sides, 96 bright	letter (HPJ1124) letter, 3-hole prepunched (HPJ113H) legal (HPJ1424) 11 by 17 (tabloid) (HPJ1724) A4 (Europe) (CHP310)

Glossy paper

CAUTION

Not all HP LaserJet printers support printing on all of the print media that is listed in the following table. Please see the support documentation that came with your product to determine if your product supports a particular type of print media.

Media	Use with	Use for	Characteristics	HP part numbers
hp high gloss laser paper	monochrome and color laser printers	brochures, catalogs, business plans, photographs, and images	120 g/m ² (32-lb bond), 200 sheets, high-gloss finish coating on both sides, 95 bright	letter (Q2419A) 11 by 17 (tabloid) (Q2420A) A4 (Q2421A) A3 (Q2422A)
hp soft gloss laser paper	monochrome and color laser printers	flyers, handouts, sales briefs, proposals, and color images	120 g/m ² (32-lb bond), 200 sheets, satin finish coating on both sides, 96 bright	letter (Q4179A) A4 (C4179B)
hp soft gloss laser paper	monochrome and color laser printers	flyers, handouts, sales briefs, proposals, and color images	105 g/m ² (28-lb bond), 500 sheets, satin finish coating on both sides, 96 bright	letter (Q2415A) 11 by 17 (tabloid) (Q2416A) A4 (Q2417A) A3 (Q2418A)

Heavy paper, cover paper, and cardstock

CAUTION

Not all HP LaserJet printers support printing on all of the print media that is listed in the following table. Please see the support documentation that came with your product to determine if your product supports a particular type of print media.

Media	Use with	Use for	Characteristics	HP part numbers
hp premium cover paper	monochrome and color laser printers	postcards and document covers	200 g/m ² (75-lb cover), 100 sheets, super smooth matte finish on both sides, 96 bright	letter (Q2413A) A4 (Q2414A)
hp tough paper	monochrome and color laser printers	signs, maps, restaurant menus, waterproof documents, and tearproof documents	5 mil thick (0.197 inches) (approximately 44-lb bond equivalent), 50 sheets, satin finish coating on both sides, waterproof, tearproof	letter (Q1298A) A4 (Q1298B)

Recycled paper

CAUTION

Not all HP LaserJet printers support printing on the print media that is listed in the following table. Please see the support documentation that came with your product to determine if your product supports a particular type of print media.

Media	Use with	Use for	Characteristics	HP part numbers
hp office recycled paper	monochrome laser printers	training manuals and general office printing	75 g/m ² (20-lb bond), 500 sheets, matte finish on both sides, contains 30 percent post-consumer content (satisfies US Executive Order 13101), 87 bright	letter (HPE1120) 3-hole prepunched (HPE113H) legal (HPE1420)

Transparencies

CAUTION

Not all HP LaserJet printers support printing on transparencies. Please see the support documentation that came with your product to determine if your product supports transparencies.

Media	Use with	Use for	Characteristics	HP part numbers
hp color LaserJet transparencies	HP color LaserJet printers	transparencies	5 mil thick (0.197 inches), 50 sheets, premium coated on both sides	letter (C2934A) A4 (C2936A)
hp LaserJet monochrome transparencies	HP monochrome LaserJet printers	transparencies	4.3 mil thick (0.169 inches), 50 sheets	letter (92296T) A4 (92296U)



Glossary

A-series of paper sizes The ISO A-series of paper sizes is based on the Lichtenberg Ratio, which is an aspect ratio of 1 to the square root of 2. A0 size paper is 841 by 1,189 mm in size, which is 1 square meter in area and has a 1.414:1 aspect ratio. Each subsequent size is half the area (determined by halving the long dimension). If the value is an odd number (for example, 1,189 mm), then the subsequent value after halving is truncated (for example, 594 mm). The aspect ratio of 1:1.414 is maintained throughout the A-series of paper sizes.

basis weight Basis weight is the weight of a ream of paper (500 sheets) that has been cut to the basic size. Basis weight is an important characteristic of paper. Paper that is too light or too heavy can cause misfeeds, misstacking, jams, poor print quality, or excessive mechanical wear to the printer.

basic size Basic size is a specified size for a grade of paper. Basic sizes have evolved from custom and usage.

brightness Brightness refers to the reflectance and whiteness of a sheet of paper. Higher brightness papers are more expensive to produce and are usually associated with higher quality.

caliper Caliper is the thickness of a sheet of paper or other print media. It is typically specified in mils (one-thousandth of an inch) or millimeters. It is closely associated with paper weight but not directly associated, because some papers have more bulk (more density) than others.

carrier sheet The carrier sheet is the sheet to which labels are temporarily attached. Usually this sheet has a “slick” feeling or appears shiny.

composition Composition (furnish) is the mixture of various materials, such as fiber, filler, sizing materials, and other additives, that are used to make the paper stock. Fillers such as calcium carbonate, clay, or talc are added to paper to fill in the spaces between fibers.

For optimum performance of your HP LaserJet printer, use paper that is made from 100 percent chemical wood pulp or cotton fiber. Recycled paper, made with no more than 5 percent groundwood, is also acceptable. To ensure that paper of a special fiber composition will work correctly in your printer, test it before purchasing large quantities.

copier paper A grade of paper that is suitable for printing in the electrophotographic process. This paper is characterized by having a smooth finish, heat stability, non-curling qualities, and good aesthetic properties (such as color, brightness, and cleanliness).

curl The amount of curvature or wave in a sheet before or after printing. Sheets might curl before printing if they are exposed to humid conditions or very dry conditions. Residual stresses in the sheet or high moisture content can also affect the level of curl after printing. Good process control by the paper manufacturer and proper paper storage and handling will minimize curl problems.

Curl is typically measured by laying the sheet of paper on a flat surface and measuring the height of the corners. There are two types of curl:

- In-ream curl is the amount of curl in a sheet of paper before printing. In-ream curl results from the paper-manufacturing process or from exposure to the environment. Paper with excessive in-ream curl might lead to feeding and print-quality problems.
- Post-image curl is the amount of curl in a sheet of paper after printing. Post-image curl results from exposure to the fusing process and the paper path in the printer. Paper that has excessive post-image curl can be difficult to handle or to use in automatic-feed photocopiers.

cut-edge condition Condition of the edges of paper, which can affect paper's ability to feed properly.

cutouts Any portion of the media that has been removed, including binder holes, notches, square cuts.

density Relative darkness of the print.

die-cuts Cuts between individual labels. Die-cuts are made by a machine in a predefined pattern.

duplexing Printing on both the front and back sides of a sheet of paper.

electrical properties The electrical resistivity of the print media. The electrical resistivity of the paper is one of the most important properties for copier- and laser-grade papers. If resistance is too high, static buildup problems can occur with paper handling and print quality. If electrical resistivity is too low, poor image transfer and low density can result. Generally, paper has very high resistance, so paper manufacturers add salts or other materials to lower the resistivity.

face sheet The face sheet is the printable surface on a sheet of adhesive labels. It can be made from different materials, including paper, polyester, and vinyl. It is common for a face sheet to be die-cut so that individual shapes can be removed after printing. Polyester and vinyl labels require a topcoat to provide the proper electrical and toner adhesion properties. It is important to purchase labels from a knowledgeable supplier who is familiar with these processes and with laser printing.

felt side versus wire side Some methods of manufacturing paper result in two-sided paper that has properties that differ from one side to the other. Along with other process variations, these properties can make one side of the paper the preferred side on which to print. The "top" side of the paper sheet, as it is formed, is known as the felt side. The "bottom" side is known as the wire side. Most manufacturers indicate the preferred printing side on the package. See ["Reading a ream label" on page 5](#).

finish/smoothness Characterizes a paper's finish. Textured paper causes inconsistent or blotchy print and can wrinkle. Printed output on textured paper might have broken character edges and show poor toner adhesion. Glossy-smooth paper tends to highlight defects and might not hold toner. For best results, use smooth paper.

Paper for laser printers should not have a heavy texture or a glossy smoothness unless the paper is specifically designed to work with your HP LaserJet printer. If you want to use a glossy paper in the HP color LaserJet printer, try HP's soft gloss and high gloss paper (see "[Ordering HP print media](#)" on page 35). For sharp resolution or detail, use a smooth paper.

Paper finish is typically measured by using air-leak methods. We recommend a range for smoothness that uses the Sheffield method. Equivalent values for other methods can be found in "[Comparisons of paper smoothness](#)" on page 33.

Avoid using paper that has embossed or raised surfaces, because spotty printing and misfeeding can occur. It is possible to print satisfactorily on paper that has embossed areas in the leading edge, trailing edge, or areas where print will not appear on the paper; however, misfeeding or jamming can occur.

finishing precision Dimensions (length and width) of a piece of media, how closely it is cut to the stated size, and how square it is. Use media that is accurately cut, so that it can be handled properly.

furnish (composition) Composition (furnish) is the mixture of various materials, such as fiber, filler, sizing materials, and other additives, that is used to make the paper stock.

fusing compatibility Compatibility of print media used in the printer and how it reacts when exposed to the fuser's temperature of:

- 205° C (401° F) for 0.1 second (0.2 second for HP color LaserJet printers) for paper, labels, and envelopes; and
- 205° C (401° F) for 0.1 second (0.4 second for HP color LaserJet printers) for overhead transparency materials.

Print media should not discolor, melt, offset, release undesirable emissions, or break down in any way when exposed to these temperatures for the specified time period.

grain The orientation of paper fibers in paper. Fibers tend to align themselves in the process direction of the paper machine. Papers are stiffer in the grain direction. Most cut sheet papers are cut long grain (that is, with the grain direction parallel with the long edge of the sheet). For heavier-weight papers (greater than 135 g/m² in weight) Hewlett-Packard recommends using short-grain paper, if available, to improve feeding and reduce wear to the paper path.

grammage Grammage is the metric standard for specifying paper weight and is expressed in grams per square meter.

gray background Paper looks gray or appears dirty because small toner particles are transferred to non-printed areas (white space), and can be corrected by changing paper or increasing the toner density setting on your printer. This condition is a symptom of a print-quality problem.

groundwood Wood fibers that are extracted using a mechanical rather than a chemical process. Groundwood papers are generally weaker than chemical-wood papers.

ISO International Standards Organization.

JIS Japanese Industrial Standards.

MFP Multifunction peripheral; also known as multifunction product or multifunction printer.

mils One mil equals 0.001 inches.

moisture content How much moisture print media will absorb or lose, depending on the humidity in the surrounding air.

Paper is hygroscopic, that is, it will absorb or lose moisture depending on the humidity in the air around it. The moisture content of paper has a great effect on its resistivity. Paper will absorb moisture in a high-humidity environment and lose moisture in a low humidity environment. Small increases in moisture content greatly reduce resistivity while small decreases in moisture content greatly increase resistivity.

Moisture content can also affect other paper properties such as curl, stiffness, and dimensional size. Higher moisture content can make paper prone to curl and wrinkling during printing, make a sheet limp, and increase the dimensions of a cut sheet. Paper performance can change significantly with seasonal or weather changes, which affect the humidity in the printing environment.

packaging Packaging is an important consideration when using paper in an HP LaserJet printer, because adequate packaging maintains the correct level of moisture and protects paper from damage during transport and storage.

perforations A hole or series of holes punched through the paper to aid in the separation of one piece of paper from another.

pH Refers to the acidity/alkalinity of paper as determined by the TAPPI (Technical Association of the Pulp and Paper Industry) cold-extraction method.

photocopy paper See *copier paper*.

post-consumer waste Manufactured material that the customer has used. Post-consumer waste can be office paper, mail, used boxes, old newspapers, or magazines.

pre-consumer waste Material that never reaches the customer after it has been manufactured. Pre-consumer waste can be unused paper stock, bindery trimmings, envelope cuttings, business forms, or unsold books or magazines.

print media Paper, envelopes, cardstock, overhead transparencies, and labels that are used with printers. Print media used in HP LaserJet printers must meet the guidelines and specifications listed in this guide.

ream A ream is a quantity of 500 sheets of paper. Paper is often packaged and sold in reams.

simplex Printing on one side of a sheet of paper.

smoothness Surface smoothness is determined by measuring the rate of air flow between the sheet surface and a flat reference surface. Smoothness usually is expressed in Sheffield or Bekk units.

stiffness How resistant print media is to bending or flexing. A minimum stiffness is required in order for paper to separate from the rollers inside of the printer. Most long-grain papers that are heavier than 60 g/m² will have adequate stiffness to transport through the printer. Generally, stiffness increases with paper weight.

surface roughness Surface roughness of papers can affect print quality, feeding, and fusing (toner adhesion). If paper is very smooth, background particles are more easily seen, and sheets tend to stick together and create multiple-sheet feeds. Very rough papers can degrade transfer of toner onto the page, causing jagged edges or toner scatter. Fusing (toner adhesion) can also be drastically reduced on very rough papers. Roughness is usually measured using an air leak method such as the Sheffield method. Typical Sheffield values for different paper surfaces are within the following ranges:

- about 120 to 150 for photocopy grades (wove or regular finishes)
- about 40 to 60 for very smooth laser or coated grades
- about 250 to 300 for cockle finishes
- greater than 350 for traditional linen and laid finishes

watermark An impression made in a wet sheet of paper as it is being manufactured. Watermarks are visible when the sheet is held up to light. They appear as a word, symbol, or other impression.

waste paper A generic term used for post-consumer waste and some pre-consumer waste.

wax pick Characterizes the resistance of the surface layer of a sheet to the breakaway of surface fragments. Expressed in Dennison units.

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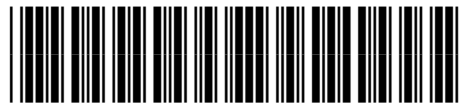
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