

HP ImageREt 3600



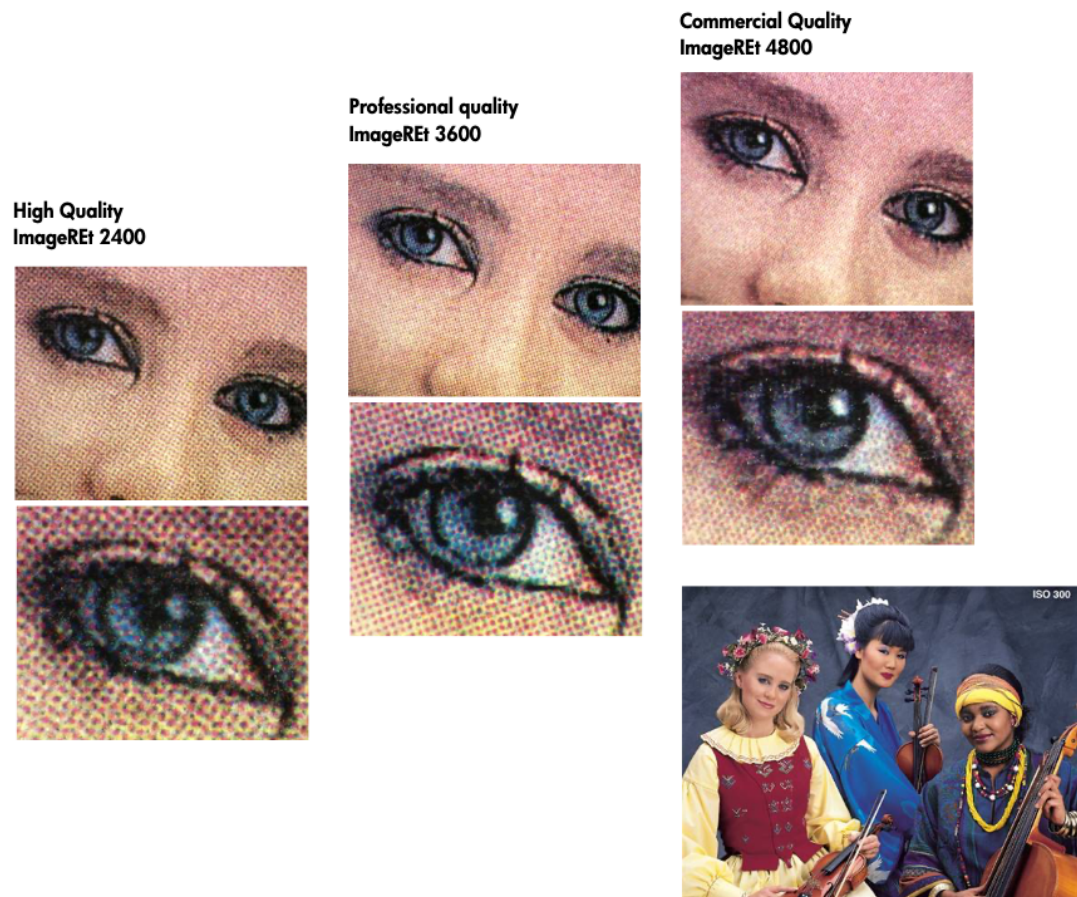
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Overview

HP ImageREt print technology is a system of innovative technologies developed exclusively by HP to deliver superior print quality. The HP ImageREt system sets itself apart from the industry with integrated technology advancements and by optimizing each element of the print system.

Several categories of HP ImageREt have been developed for a variety of user needs. The system's foundation is comprised of key color laser technologies—including image enhancements, HP Smart supplies and high-resolution imaging—that provide great color automatically, right out of the box. As the level or category of ImageREt increases, these core technologies are refined for more advanced system usage, and additional technologies are integrated.

There are currently three levels of HP ImageREt print technology, developed for different user needs. They are HP ImageREt 2400, HP ImageREt 3600 and HP ImageREt 4800.



The following table details the similarities and differences between each HP ImageREt level:

Printing technology	ImageREt 2400 (High Quality)	ImageREt 3600 (Professional Quality)	ImageREt 4800 (Commercial Quality)
Imaging system	<ul style="list-style-type: none"> High resolution dual-beam scanner 	<ul style="list-style-type: none"> High resolution dual-beam scanner 	<ul style="list-style-type: none"> High resolution dual-beam scanner
Print mechanism	<ul style="list-style-type: none"> Robust 	<ul style="list-style-type: none"> Accurate 	<ul style="list-style-type: none"> Precise
Image enhancements	<ul style="list-style-type: none"> Great color out of the box Excellent Edge Control <ul style="list-style-type: none"> Color Ret Trapping Adaptive halftoning Halo Reduction Neutral gray treatment 	<ul style="list-style-type: none"> Great color out of the box Excellent Edge Control <ul style="list-style-type: none"> Color Ret Trapping Adaptive halftoning Halo Reduction Accurate half toning Neutral gray treatment 	<ul style="list-style-type: none"> Outstanding color out of the box Excellent Edge Control <ul style="list-style-type: none"> Adaptive halftoning Trapping Halo Reduction Precision half toning Neutral gray treatment
Adaptive gloss	<ul style="list-style-type: none"> Selective-gloss Instant on fusing 	<ul style="list-style-type: none"> Selective-gloss Instant on fusing 	<ul style="list-style-type: none"> High-gloss fuser
Color control	<ul style="list-style-type: none"> Intelligent calibration <ul style="list-style-type: none"> Automatic closed loop color calibration Strategic Timing Environmental compensation Digital Imaging Enhancements Multiple Color Themes HP postscript CMYK emulation 	<ul style="list-style-type: none"> Intelligent calibration <ul style="list-style-type: none"> Automatic closed loop color calibration Strategic Timing Environmental compensation Digital Imaging Enhancements Multiple Color Themes HP postscript CMYK emulation 	<ul style="list-style-type: none"> Intelligent calibration <ul style="list-style-type: none"> Automatic closed loop color calibration Strategic Timing Environmental compensation Multiple Color Themes HP postscript CMYK emulation
Media handling	<ul style="list-style-type: none"> HP Glossy paper laser system optimization AT VC 	<ul style="list-style-type: none"> HP Glossy laser paper system optimization Automatic Media sensing AT VC 	<ul style="list-style-type: none"> HP Glossy laser paper system optimization Superior media handling and Commercial document quality
Supplies	<ul style="list-style-type: none"> HP Smart printing supplies ColorSphere Toner All in one toner cartridge 	<ul style="list-style-type: none"> HP Smart printing supplies ColorSphere Toner All in one toner cartridge 	<ul style="list-style-type: none"> HP Smart printing supplies Chemically-grown spherical dual-component polymer toner
Supported HP Color LaserJet printers	<ul style="list-style-type: none"> HP Color LaserJet 2550, 2600, 3000 series printers, 2800aio series 	<ul style="list-style-type: none"> HP Color LaserJet 3600, 3800, 4700 series printers, 4730mfp series 	<ul style="list-style-type: none"> HP Color LaserJet 9500 series printer, 9500mfp

HP ImageREt 3600

HP ImageREt 3600 is a complete HP proprietary printing solution that offers superior image enhancements for general office documents and marketing collateral. HP ImageREt 3600 features innovation such as intelligent calibration, Image Mode, HP Smart printing supplies with new HP ColorSphere toner, and automatic media-type sensing to deliver vibrant, glossy images when printing marketing collateral and business documents on HP glossy laser photo papers. With HP ImageREt 3600, the printer is designed and configured to produce professional-quality images automatically, right out of the box. This enables users to broaden their use of color to efficiently communicate and promote ideas.

With HP ImageREt 3600, the printer is designed and configured to automatically produce the best possible output for all your printed documents. What once took hours to do by hand is now done instantly inside the printer. Automatic internal color adjustment provides consistent color over a range of environments. Press options include: SWOP, Euroscale, and DIC. HP expertise is built into the printer, so conversions from standard RGB (sRGB) or CMYK to the device colors is always optimal.

As image printing improves, consumers have become more sophisticated and discriminating. However, it is often difficult to pinpoint which elements determine good image quality. Some believe that the number of dots-per-inch (dpi) is a measure of image quality, and that a higher dpi means better image quality. This concept can be misleading.

The dpi specification describes only a small part to the printing system, dpi refers to the laser scanner assembly's addressability—the frequency that the exposure device can be turned on and off. Dpi does not directly relate to an image's resolution because it does not encompass other steps of the imaging process, which may include sophisticated imaging algorithms, toner development, image transfer, and fusing. In modern printing systems with complex imaging algorithms, dpi is a poor estimate of image quality.

HP ImageREt 3600 is a result of the following seven notable innovative printing technologies that work together to deliver professional image quality:

- High-resolution laser imaging system with dual beam scanner
- Accurate print mechanism
- Superior image enhancements
- Instant-on Technology with selective gloss
- Intelligent color control
- System-optimized for HP Glossy laser photo paper with automatic media-type and environmental sensing
- HP Smart printing supplies with new HP ColorSphere toner

1. High-resolution laser imaging system with dual-beam scanner

Benefit: Superior image detail and tone rendition

Technologies: Dual-beam scanner, multi-level positioning laser exposure combined with multi-layering technology

The electrophotographic imaging system consists of an organic photoconductor and a laser diode exposure system. The organic photoconductor changes charge with exposure to light, and is essential to providing the system's excellent image quality. Where the laser writes to the organic photoconductor, positively charged areas are produced, and the negatively charged toner adheres to these areas.

The HP Color LaserJet series printers with ImageREt 3600 use a proprietary dual-beam scanning system that uses two laser beams that reflect off the each face of the mirror simultaneously. This provides the ability to print two scan lines for each mirror facet, effectively doubling the scan rate.

The dual beam scanning system has several advantages over conventional methods:

- Achieves higher print speeds without rotating the scanner at excessive speeds. Because the scanner rotates more slowly, simple components can be used that deliver better reliability.
- Since the scanner rotates more slowly, scanner acceleration time is reduced, which decreases first-page-out time.
- With a low number of facets on the rotating mirror, the scanner and optical path are smaller and more compact.

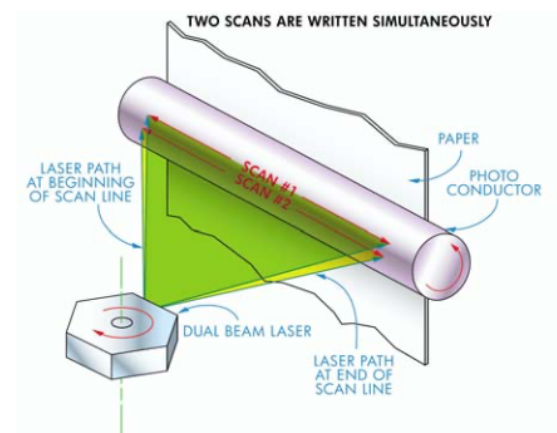


Figure 1. Dual beam scanner

Multi-level/multi-position laser exposure

With HP's extremely sophisticated laser scanning assemblies plus industry-leading laser modulation control, it is possible to achieve high resolution and vary the size and position of each laser exposure within the 600 dpi addressable engine grid. This ability is what provides HP's multi-level exposure and multi-positioning capabilities. The combination of size and position enable truly spectacular detail and reproduction in printed materials.

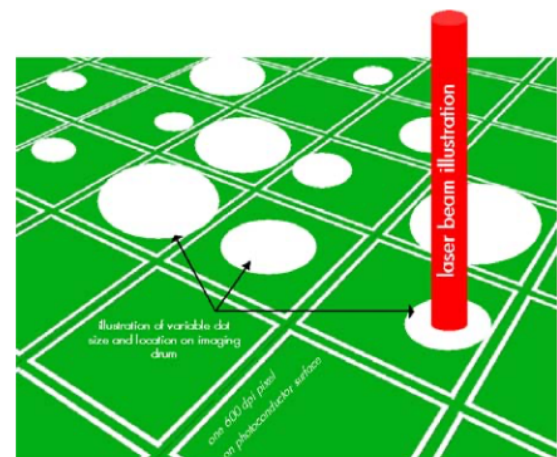
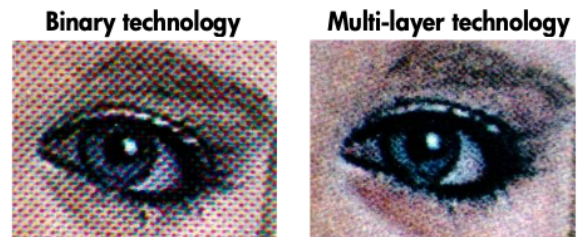


Figure 2. Example of variable dot size and placement.

Multi-level printing

The multi-level printing process precisely controls color by combining up to four colors within a single 600 dpi pixel and by varying the amount of toner in each pixel. As a result, over 100,000 different colors can be created in a single 600 dpi pixel. Combined with high-resolution halftoning, HP ImageREt multi-level technology creates millions of smooth colors, sharp images, and crisp text.

By contrast, the single level (binary) printing process cannot vary the amount of toner in a pixel. Each pixel receives either no toner or a full pixel level of toner for the four toner colors. The primary yellow, cyan, magenta, and black toner colors can only be mixed to create red, green, and blue, meaning that only eight different colors can be created in each 600 dpi pixel. In order to create the millions of colors required to print color images, binary printers must use low-resolution halftones with large visible dots.

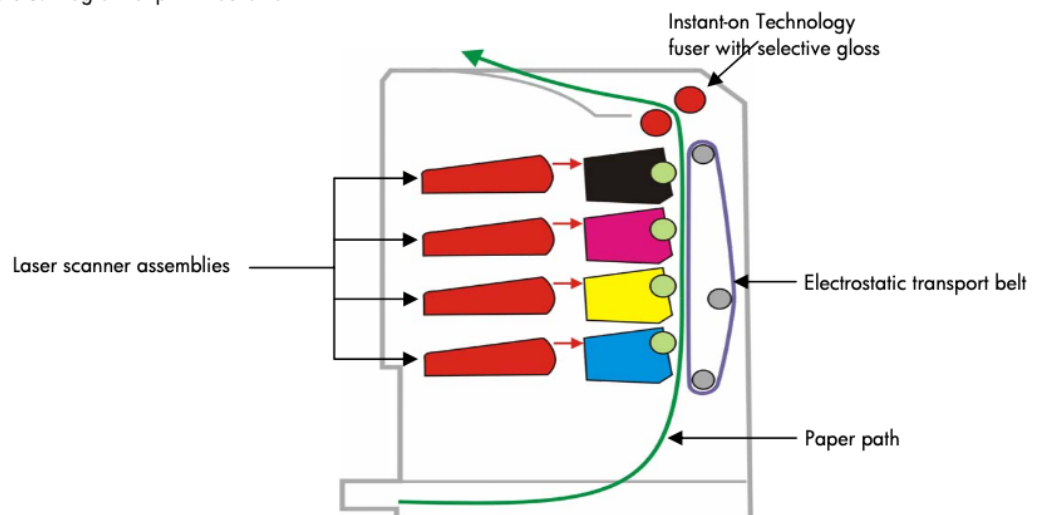


2. Accurate print mechanism

Benefit: Excellent uniformity and color plane registration

Technologies: Media and environmental sensing, ridged frame, vertical in-line process, helical drive gears, precise motor control, high-quality laser scanners

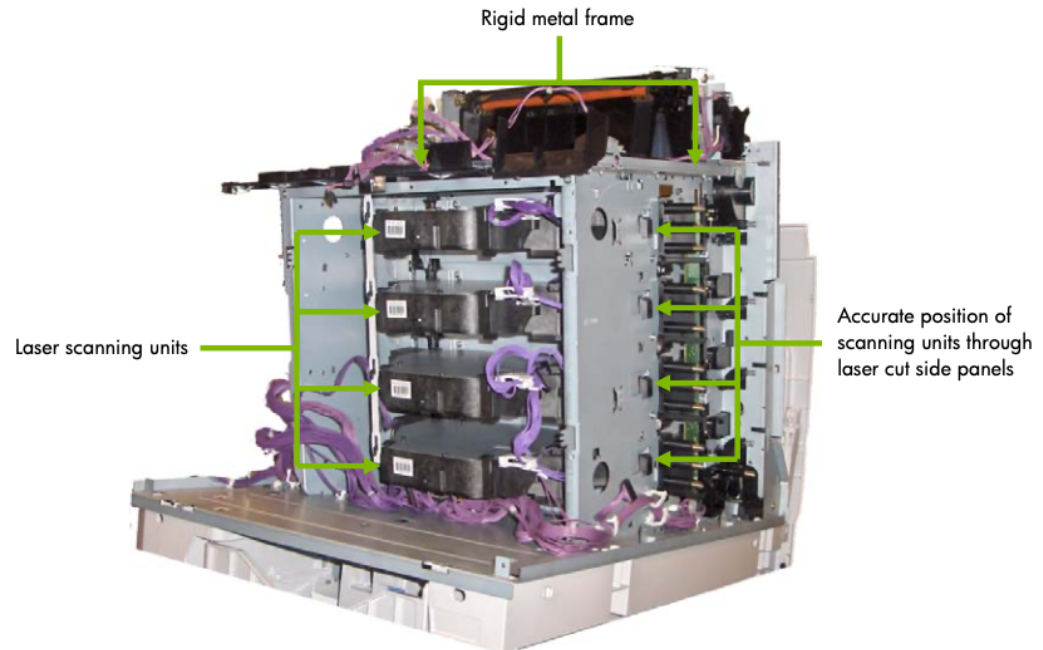
Figure 3. Diagram of print mechanism



The printer features a direct-to-paper architecture, which means that toner is transferred from the organic photoconductor directly to the media rather than to an intermediate transfer device. While this architecture provides excellent detail with sharp text and line art, it is only possible with sophisticated sensors that signal adjustments to the print system according to the media's electrical properties since the electrophotographic printing process is charge driven. With direct-to-paper architecture, the media is a dynamic element of the print system. An electrical sensor measures the resistivity of each sheet of media that enters the print system while environmental sensors make

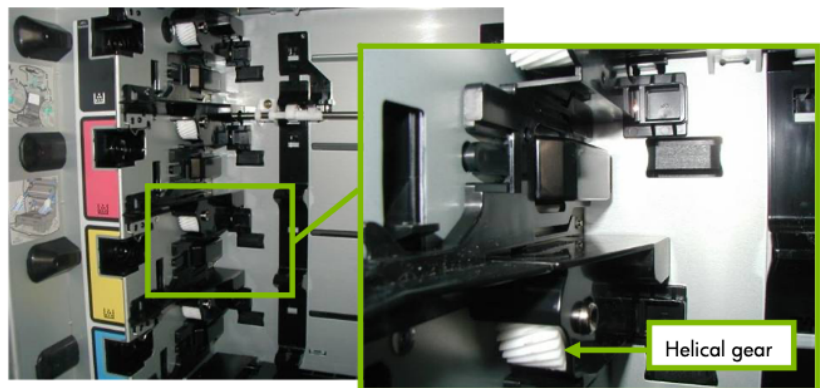
adjustments to accommodate specific environmental conditions. These measurements, combined with proprietary algorithms, make it possible for the printer to deliver excellent image quality on a variety of media under multiple environmental conditions. For more information, see “Media type sensing” on page 13.

The printer’s frame is a crucial component of the printing system. During a typical print cycle, many processes occur simultaneously, and some of these processes generate small shocks and vibrations that can influence the performance of other processes. HP designs and test frames to eliminate these sources of unwanted resonance and vibrations.



The vertical in-line process of the printer is designed with extremely accurate alignment of critical components to aid in precise dot positioning and color plane registration. Close component proximity is accomplished with laser positioning on the frame side panels, and all major components are attached to the frame side panels, which provides independent stability for each component.

Helical gears with spiral curved gear surfaces are used in areas where precise rotation is required. These gears not only provide quieter operation, but also help reduce rotational velocity variation by contacting multiple teeth simultaneously, which provides a larger gear contact area and results in smoother printing.



All of the main drive motors are brushless DC motors. Motors that drive critical components such as the photoconductors and fuser use Digital Signal Processing (DSP) technology to precisely control speed. This method uses a *mini network* within the printer to monitor and adjust the rotation speed of each component individually. Minute speed adjustments are continually made during the printing process to insure that all the major components are rotating at the appropriate speed and are synchronized.

During startup, changing of toner cartridges, or during a CALIBRATE NOW procedure initiated from the control panel, the printer performs an internal, automatic closed loop color plane registration procedure. It does this by writing chevron patterns of toner to each side of the transport belt and then reading those locations. With this data, the printer can dynamically maintain best in class color plane registration which enables the use of other technologies, such as trapping and halo reduction (for more information, see the following section, “Superior image enhancements,” on page 8). Trapping and halo reduction are only possible if the original color plane registration is excellent.

3. Superior image enhancements

Benefit: Excellent tone scale, text sharpness, and line clarity out-of-the-box

Technologies: Great color out-of-the-box; Image Mode; and edge control, including adaptive halftoning; accurate halftoning, automatic in-RIP trapping; in-RIP halo reduction; Color REt; and neutral gray treatment

Great color out-of-the-box





HP implements several methods to produce the most satisfying color rendering possible with the printer, including:

- Utilizing the maximum amount of colors available to the printer
- Adjusting color rendering for memory colors and preference color
- Producing pleasing skin tones
- Producing vibrant graphics while at the same time providing excellent images
- Optimizing color for different media types

Excellent edge control

Edge control is comprised of three components: adaptive halftoning, trapping, and Color REt. These components affect edges and near edges and are designed into the printer through HP proprietary technologies; they occur automatically and do not affect printing performance or speed. They are described in the table below.

Color REt¹	Color REt is a proprietary HP technology that has been adapted from monochrome HP LaserJet printers to include color. Color REt is a new feature that smoothes edges by intelligently changing the size and position of the dots that make up the edge of a solid object. It is optimized to work on solid color edges: red, blue, green, black, and other solid colors. This ability to grow and move dots increases the apparent resolution well above the engine’s native addressability.
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Trapping	Automatic In-RIP Trapping is an HP-patented image enhancement feature that involves deliberately overlapping one color onto another to guarantee high-quality edges between adjacent colors. HP trapping is unique compared with traditional press implementation because it includes halo reduction. While it used to take graphic designers or commercial press operators many hours to do this manually, the HP-enhanced version is offered as standard, performed automatically, and with no performance penalty.		Without trapping
Halo Reduction	Automatic In-Rip halo reduction makes one color intelligently recede from the edge of the other color, reducing the overlap and making it less visible. For example, a process black line is composed of black, the dominant color, and cyan and magenta, the subordinate colors. The cyan and magenta near the edge of the black line are reduced or removed. This prevents color from being seen on the edge of the black line. Halo reduction can also be applied to other line colors, like green lines, where cyan is dominant and yellow is the subordinate color		With trapping
Adaptive halftoning²	<p>Adaptive Halftoning is an HP-patented image enhancement feature that increases edge smoothness of text and graphics while maintaining the quality of area fills. One of the difficulties of digital color printing is producing smooth area color while at the same time producing smooth edges.</p> <p>Adaptive Halftoning provides a solution to this problem. Smooth area color is optimized by selecting low frequency digital halftones. The color is built up by turning on and off dots. At a normal viewing distance, your eye blends the dots together so the color looks smooth. Using low-frequency halftones creates smoother, more accurate color in large areas. Edge sharpness is optimized by selecting high-frequency digital halftones. While the eye blends the dots in smooth areas, it is also very good at discriminating minor variations at edges. High-frequency halftones are used to smooth the jagged edges. Adaptive Halftoning provides a solution to the requirement for smooth color and smooth crisp edges by locating and increasing the digital halftone frequency at edges. This is a patented technology developed by HP. It is implemented in specialized electronics to provide fast printing performance.</p>		12 pt text without adaptive halftoning
			12 pt text with adaptive halftoning

Accurate halftoning

The consistency and reliability of the printer's engine, combined with smooth printing that is nearly artifact free, allows for higher halftone frequencies that produce accurate halftones. The higher frequencies and other HP Image REt 3600 print system elements including HP's proprietary software enhancements and HP's high resolution imaging system result in best in class image detail, crisp text and graphics.

For digital laser printers, a halftone is a collection of dots within a cell. HP proprietary technology varies dot placement and density within the 600 dpi position grid. Cells are repeated at a fixed frequency, which is also referred to as the halftone screen frequency. The frequency is dependent on a number of elements, including the media, color stability, and dot control. In commercial press, newsprint is typically about 85 lpi (a screen frequency of 85 lines per inch). Book and magazine screen frequencies vary from about 100 lpi to about 300 lpi. The lower the halftone screen frequency, the more visible the halftoning is to the human eye. For laser printers, the quality of the print mechanism and consumables enable higher halftoning frequencies.

Neutral gray treatment

This feature allows the selection of the neutral gray treatment of either black-only or four-color process grays. Black-only can be selected to print black text, delivering sharp, high contrast text and lines. If four-color grays are selected, black is printed using all four process colors (cyan, magenta, yellow, and black), known as process grays. This selection is useful for printing photographs, since it produces richer grays and blacks that blend smoothly with surrounding colors.

4. Instant-on Technology with selective gloss

Benefit: Excellent gloss matching to media on a variety of media types, producing high quality professional documents, while providing technology leading first-page-out time from Powersave

Technologies: Instant-on Technology, print modes optimized for different media types, media flexibility

The fusing system

In an effort to provide maximum versatility, HP has developed a fusing system that delivers excellent speed, finish (image gloss), and media flexibility. This unique fuser employs an dual ceramic heating technology. The printer's fuser is capable of heating up very quickly, providing a fast first page out, even from the Powersave state.

The fuser sleeve is constructed from a thin but durable polymer material. Because the sleeve is thin, there is little material to heat, and the heating time is low, enabling a fast first page out.

The heating core is strategically placed inside the sleeve, very close to the printed side of the page. This allows most of the heat generated by the fuser to fuse the toner, rather than being wasted on surrounding areas—a critical element in achieving the printer's high speeds.

The heating core is a ceramic substrate that uses a resistance heater. It operates at lower temperatures than some competing technologies. Due to the lower operating temperature and material selection, it has proven to be durable, even over millions of temperature cycles.

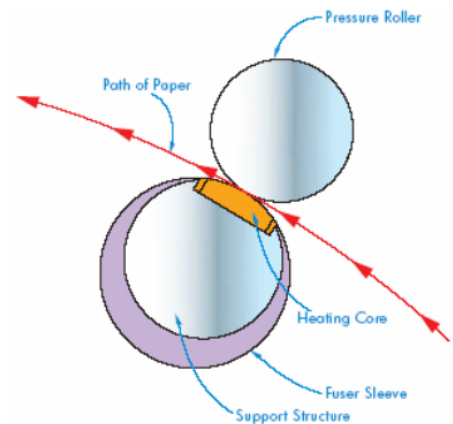


Figure 4. Instant-on Technology with selective gloss

5. Intelligent color control

Benefit: Consistent, reliable color over printer life in a variety of environmental conditions,

Technologies: Closed-loop color calibration, environmental sensor

With intelligent color calibration, the printer provides color printing that is consistent from page to page, regardless of the time between print jobs or the printing environment. Intelligent color calibration is designed to occur automatically at intervals that maximize printer availability.

The printer uses an intelligent calibration technology to achieve consistent color in any environment. The technology has two basic components: toner-level adjustment and strategically timed calibrations.

Automatic closed loop color calibration

A calibration sequence measures toner patterns and feeds the results into a control system that adjusts the amount of toner to a specified level. This adjustment ensures that the colors print reliably and consistently. This adjustment is stored in the printer's memory and applied to every printed page.

Under normal printing conditions, printed images are transferred directly to paper, but during the calibration sequence, the calibration image prints to the belt surface. The printer uses the surface of the electrostatic transfer belt as a reference point to make all calibration adjustments. The calibration image can be easily cleaned from the belt prior to printing to paper. Two sensors are strategically located near the belt surface to measure toner levels, and both sensors are used simultaneously to

Intelligent calibrations with strategic timing

Calibrations occur at set intervals, are strategically designed to maximize printer availability, and may be initiated either automatically or manually from the control panel. Calibration occurs automatically:

- When the fuser temperature registers 122 degrees F (50 degrees C) or less at power on. If the printer is powered off overnight, it performs a calibration when powered on. If the printer has been in use (in Ready state), a calibration will not occur when the printer is turned off and on.
- When a print cartridge is replaced.
- At every 1,000-page interval after replacing a print cartridge.
- With environmental condition changes. In some cases, a printer is subjected to widely variable temperature and humidity conditions. When changes in either temperature or humidity reach a certain point, a calibration sequence occurs.
- When the electrostatic transfer belt is replaced.

Self-timer feature

A new self-timer feature improves printer availability. By entering the date and time in the control panel, the printer can be automatically configured to *wake up* from sleep mode. If a printer goes into sleep mode, sending a print job wakes it up. Normally when the printer wakes up, it requires a minute or so to initialize and the user would have to wait until the initialization sequence was complete before the job would finish. Using the self-timer allows customers to configure their printer to wake and initialize during off hours, so initialization does not interfere with productivity.

Multiple color themes³

The printer's default RGB color tables have been optimized to produce the best color appearance match between a page viewed on a monitor and that same page printed and viewed in a typical office environment. Other color renderings are available with the printer, including:

Adobe RGB (1998)	Can be used for printing from Adobe PhotoShop® or other software or devices that use Adobe RGB (1998) color, the printer enables direct Adobe RGB (1998) color printing to provide increased color fidelity and ensure that printed output meets your expectations.
CMYK+ color	Provides color output that is more consistent with original RGB color images, even after images have been rendered for analog offset press printing. It delivers consistent and intelligent conversion from analog offset press colors to the richer and more vibrant colors available with digital printers. Skin tones and grayscale remain unchanged, but colors appear more vivid without being saturated. CMYK+ color allows creative professionals to produce impressive portfolio prints and presentations from CMYK print files without manual intervention or clipped colors, using the full gamut of their printer.
Custom color	Through Web-downloadable color tables that can emulate other HP Color LaserJet printers, you can easily and simply manage color and automatically receive output that meets your unique needs. For example, in the HP Color LaserJet 4700 product series custom color is set to emulate the HP Color LaserJet 4650 series printer by default.
Image Mode	Building on the technology of the HP Color LaserJet 4650 series printer's image mode, printers with HP ImageREt 3600 provide image optimization on any print media. The improved image mode is designed with images in mind, intelligently detecting and enhancing images on the page. For very best results, use the image mode with HP color laser glossy papers.
HP postscript CMYK emulation	The printer features emulation for press ink sets that are used throughout the world, including SWOP, Euroscale, and DIC. HP Default rendering is also available, and is a blend of the different ink sets with modifications to gray balance, skin tone preference, and memory color preferences.
RGB printing	sRGB is the default color space used for HP printers, Microsoft operating systems, the World Wide Web, and most office software sold today. sRGB is representative of the typical Windows computer monitor today and the convergence standard for high-definition television..

6. HP glossy laser paper system optimization

Benefit: Optimized output on HP glossy laser photo paper, reliable performance on a variety of media types in a range of environments

Technologies: Media type sensor, Instant-on Technology with selective gloss, media electrical property compensation

System-optimized for HP glossy laser photo paper

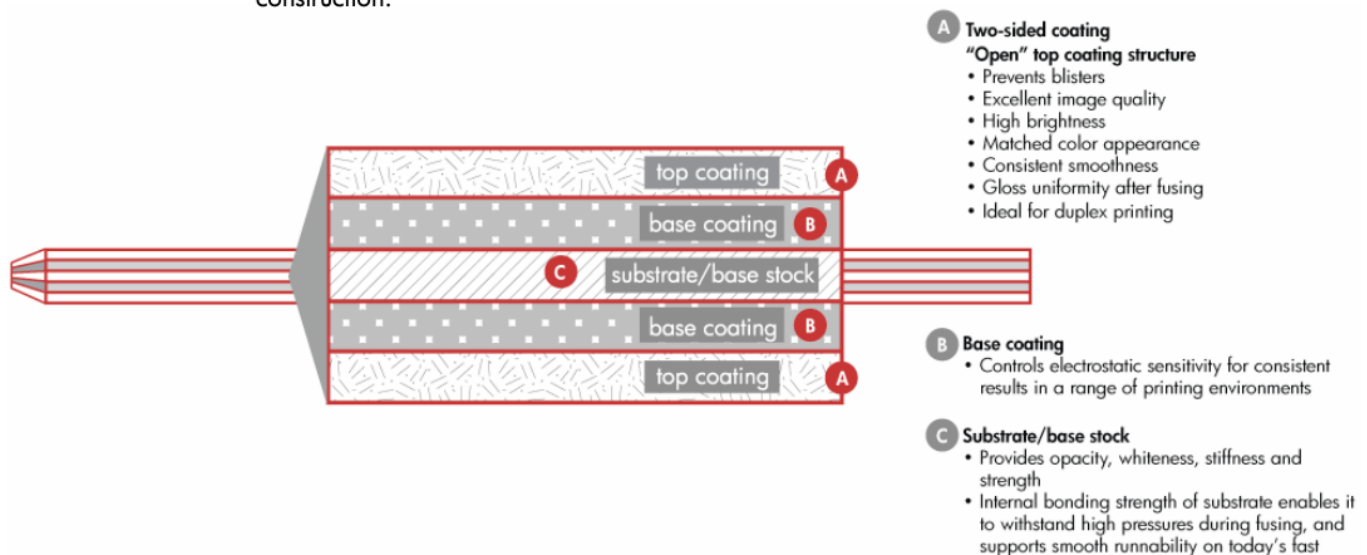
In order to make a greater impact on a customer, client, or manager, important business documents are often printed on higher quality papers than those used in the general office. These papers typically range in weights from 105 g/m² (28 lb. bond) to 220 g/m² (80 lb. cover, 58 lb. bond) or higher, and have a matte, satin, or glossy finish. While hundreds of grades of such papers are available in commercial markets, they are designed for the needs of offset and digital presses or other production equipment, not for the technical printing requirements of desktop and networked color laser printers.

Over the past few years, several coated papers in the 120 g/m² (32 lb. bond) range have been introduced that were positioned for use on laser printers, but HP testing indicates they often produce undesirable results. Generally speaking, with color laser printers, the heavier and glossier a paper is, the more difficult it is to print on successfully. This technological barrier is evidenced by the absence of heavier, glossier papers specifically for color laser printing, such as those typically used for brochures, business photos, and marketing materials. Research indicates that many businesses are interested in using heavy, glossy coated papers for these applications on color laser printers but have had limited success in doing so with the products that are currently available. HP's new proprietary technology helps businesses reliably produce professional-quality documents with confidence.

A unique technology

Most coated two-side papers on the market have a single coating layer on each side. HP's new and exclusive formulation begins with an advanced five-layer structure. Each of the five complex layers is specifically designed and precisely manufactured to address the issues discussed above. This design provides an exceptional appearance, and supports the trouble-free printing of high-quality documents on HP Color LaserJet printers. (See Figure 7.)

The science behind HP's new unique design ensures superior results in image quality, blister control, runnability, gloss stability (after fusing), and appearance. The figure below illustrates the paper's construction:



Available paper based on this new technology include:

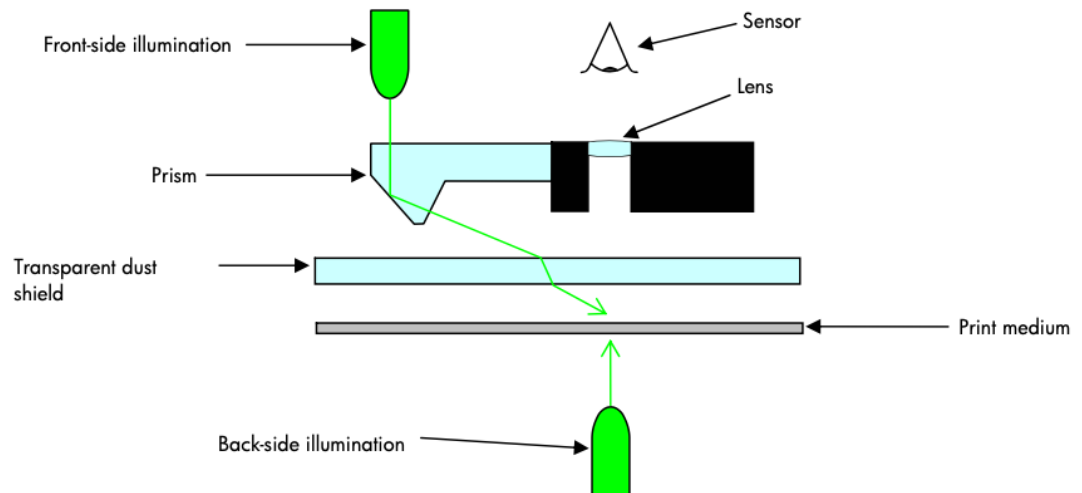
- HP Color Laser Brochure Paper, Glossy
- HP Color Laser Photo Paper, Glossy
- HP Superior Laser Paper 160, glossy
- HP Photo Laser Paper 220, glossy

Media type sensing

One advantage of laser printing is the laser printer's ability to print on a wide variety of media, including common office papers, heavy paper, glossy paper, glossy film, and overhead transparencies. However, to achieve the best print quality, the printer must be configured differently for each media type.

Because users don't always know that they need to configure for media type or how to do so, the printer automatically detects the loaded media type and selects the proper print mode without user intervention.⁴

To ensure ease of use and high-quality results, the printer delivers optimized print quality regardless of the media type. For a wide variety of media, the printer's media type sensor automatically detects the media type and configures printer settings to provide optimized print quality.⁴ The media sensor is enabled when printing from the multipurpose tray by default, and is available for printing from all other trays via the control panel.



Automatic transfer voltage control system

The printer's automatic transfer voltage control (ATVC) system combines media type sensing with environmental sensing, which significantly enhances the printer's ease of use and provides great print quality regardless of media type or environmental conditions.

Print quality optimized for a variety of HP color laser papers

For the best print quality when printing images and graphics, the printing system is optimized for HP color laser papers. From the **Paper/Quality** tab in the print driver, you can choose from Glossy, Heavy Glossy, or Extra Heavy Glossy and the printer adjusts a variety of settings, including print speed and fuser temperature, to provide the best possible print quality.

⁴ The sensor does have limitations and cannot determine all possible paper types. The printer has been designed to work best with original

7. HP Smart printing supplies with new HP ColorSphere toner

Benefit: Efficient and easy to use color, consistent image quality, oil-free fusing, superior image detail, and sharp text and line art

Technologies: HP Smart printing supplies with HP ColorSphere toner

HP ColorSphere toner delivers:

- Higher, more uniform gloss on glossy paper with faster, more complete fusing of toner to paper
- A wide range of available colors for more lifelike flesh tones, shading and gradations
- Precise placement of toner particles for consistently vibrant colors and clean lines
- Additives specifically designed to maintain charge control for reliable performance across different environmental conditions
- Additives that are molecularly bonded to toner particles to keep them intact, which helps ensure consistent output quality throughout the life of each print cartridge
- Unique toner formulations that are optimized for each HP LaserJet printer and the environmental conditions in which it must perform

All-in-one print cartridge

HP Color LaserJet all-in-one print cartridges are a crucial component of the printing system. Cartridges are shipped preinstalled in the printer, and because they are designed for high-volume printing, you replace them less often. When cartridges are replaced, an automatic toner seal remover makes replacement clean and easy. The print cartridge, toner, and imaging drum are integrated into one supply, which means that you refresh the imaging system every time you insert a new cartridge.

Improved gloss on glossy paper

When color toner uniformly fuses to paper, the gloss level increases and transitions from one color to another are more glossy and smoother. New HP ColorSphere toner was designed to provide high gloss, uniform output by carefully controlling the ratios of key ingredients in the toner.

The improvement has been significant—up to 40 percent higher gloss levels with HP ColorSphere toner on HP glossy laser photo paper when compared with previous HP color toner.⁵

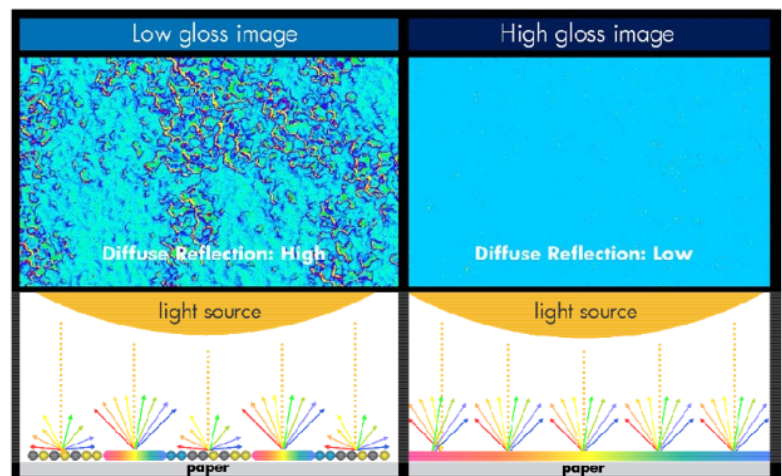


Figure 2. More complete fusing results in a smoother surface which means lower diffuse reflection. Lower diffuse reflection means higher gloss.

⁵ HP ColorSphere toner achieves up to 40% higher gloss using high-gloss mode on HP Laser Glossy Photo and Imagine Paper over HP's award-winning HP Color LaserJet

Wider color gamut

HP ColorSphere toner offers a wider color gamut (range of available colors) than ever before. This has special significance to color output, for which subtle differences in color make a big difference in overall print quality, such as with flesh tones, shadows, and gradations.

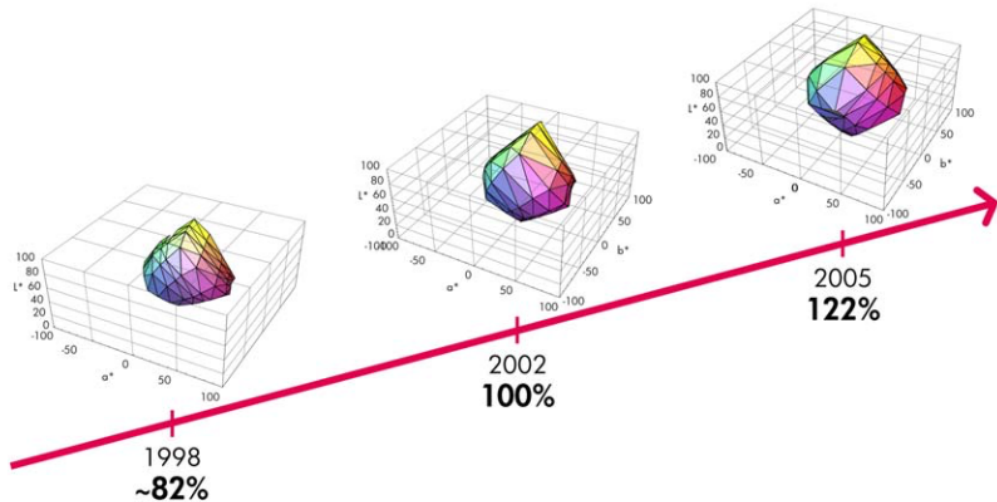


Figure 3. HP ColorSphere toner delivers a 22% wider range of color than previous HP color toner.

Better overall print quality through precise size, shape and charge control

Color laser print quality depends greatly on the precision with which toner flows through the printing system and is placed on paper. That precision depends on the ability to tightly control the electrostatic charge of toner particles.

Toner particles with uniform size and shape behave in a consistent manner. Uniformity can be measured by looking at the distribution of particle sizes, shapes, and additive content in a given sample.

Since HP engineers can count on that behavior, they design HP LaserJet printing systems to place HP toner in the most efficient and precise manner possible. Therefore, the end result of particle uniformity is reliably high-quality output with vibrant, well-defined colors and crisp, clean lines.



Figure 4. Improvements over time have made new HP ColorSphere toner more uniform in particle size, size distribution and shape. Toner charges faster, enables faster fusing, and maintains its charge throughout the life of the cartridge.

Precise charge control of toner particles is also partially dependent on surface additives. Particles with a consistent amount of additives in relation to their total mass and a consistently spherical shape will allow for much greater charge control and therefore enable higher-quality printing.

HP engineers accommodate for different user needs by fine-tuning the toner and its additives to the design of each particular printing system. This makes for an optimal toner formulation for each HP Color LaserJet printer. These efforts ensure that HP toner performs consistently throughout the life of the print cartridge, and that environmental variations are taken into account worldwide.

Summary

HP ImageREt 3600 utilizes multiple print technologies that optimize the printing system and provide high-quality, professional documents. The printer provides excellent print quality without requiring you to make difficult print quality versus performance trade-offs.

With HP ImageREt 3600, you get consistent and reliable print quality every time, and it's automatic, easy, and remarkably affordable.

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