

HP Designjet Z6200 Photo Printer series



HP Designjet Z6200 Photo Printers use new HP Vivid Photo Inks to offer fast, top-quality photo printing in a heavy-duty printing environment. New formulations for these aqueous, pigment-based inks enable faster printing, deliver improved gloss level and uniformity, reduce printer maintenance, increase scratch-resistance, provide a wider color gamut, and improve black area fill performance on backlit materials.

HP 771 Designjet Inks

HP Designjet Z6200 Photo Printers use an 8-color system of HP Vivid Photo Inks. The five (5) color inks are Magenta, Light Magenta, Light Cyan, Yellow, and Chromatic Red. Three (3) black inks, Light Gray, Photo Black, and Matte Black, give rich, neutral blacks on a broad range of materials. HP Vivid Photo Inks are available in 775ml HP 771 Designjet Ink Cartridges.

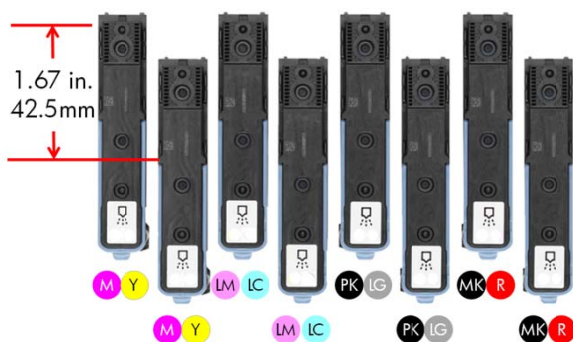
A new formulation for HP Vivid Photo Inks features new pigments, smaller pigment particles, more uniform pigment particle size color-to-color, and a new blend of polymers in the ink vehicle. Together, these advances in ink design deliver significant benefits to the user:

- 53% higher print speed on glossy media¹
- Improved gloss level and gloss uniformity
- Reduced bronzing
- ~2X improvement in scratch resistance²
- Improved black area-fill performance on backlit media
- Reduced aerosol generation for reduced printer maintenance
- Deep, neutral blacks
- Wider color gamut
- Higher ink efficiency



HP 771 Designjet Printheads

HP Designjet Z6200 Photo Printers use HP Double Swath Technology: eight (8) printheads are arranged in staggered pairs for a wide (1.67-inch/42.5mm) print swath. Printing at up to 2,400 x 1,200 Optimized dpi, HP Designjet Z6200 printers offer high image quality at high speed and a maximum print speed of 140 sq.m (1,500 sq.ft) per hour.³



Four (4) new bi-color HP 771 Designjet Printheads feature 1,056 nozzles per color, 1,200 nozzles per inch, and small drop volumes for top photo quality:

- 6 picoliters: MK, R, M, Y
- 9 picoliters: LC, LM, PK, LG

HP 771 Designjet Printheads are based on designs proven in generations of HP Z- and T-series Designjet printers. These printheads feature a snap-out/snap-in design for quick and easy replacement by the user.

¹Mechanical printing time, 60-inch HP Designjet Z6200 Photo Printer. Normal mode on glossy media (19.7 sq.m/hr) compared to a 60-inch HP Designjet Z6100 Printer (12.8 sq.m./hr).

²Based on HP R&D testing comparing to prints from HP Designjet Z6100 Printers.

³Mechanical printing time on a 60-inch HP Designjet Z6200 Photo Printer. Printed in Fast mode with Economode ON using HP Bright White Inkjet Paper (Bond).

Used HP 771 Designjet Ink Cartridges and HP 771 Designjet Printheads may be returned through the HP Planet Partners program for free and convenient recycling.⁴

User Benefits

Higher Print Speeds

Up to 53% higher throughput on glossy media was achieved through ink design and printer optimizations.⁵

The most significant contribution to higher throughput comes from improved gloss uniformity using HP Vivid Photo Inks. These reformulated inks enable high quality printing with more uniform gloss and fewer printhead passes compared to HP Designjet Z6100 Printers. For example, Glossy Normal mode on HP Designjet Z6200 Photo Printers requires only 8 bi-directional (“bi-di”) printing passes compared to 11 passes with the HP Designjet Z6100 Printer. In Glossy Best mode, only 12 bi-di passes are needed compared to 16 for the Z6100.

Writing system optimizations in HP Designjet Z6200 Photo Printers reduce the time between printhead carriage scans with better synchronization between media and carriage movement and faster swath data loading, faster processing of printer safety checks, and faster determination of the need for printhead servicing.

The HP Optical Media Advance Sensor (“OMAS”) improves positioning accuracy over the longer media advances produced by HP Double Swath Technology. Upgrades to OMAS for HP Designjet Z6200 Photo Printers include higher media backside illumination and new adaptive algorithms that optimize OMAS parameters. Media advance speed is increased up to 6 inches/sec, and accuracy is improved for more repeatable results.

Improved Gloss Level and Uniformity

Gloss in printed regions should match the gloss of the print media in image highlights⁶ over the full range of colors and print densities. If the gloss is non-uniform, at some angles of view the highlights can appear relatively dull or shiny compared to printed regions.

Because pigment inks are encapsulated in a polymer layer on the media surface, the thickness and smoothness of this layer depends on the color and print density. With pigment inks, it is challenging to obtain uniform gloss on glossy or satin media.

HP Vivid Photo Inks use smaller pigment particles with more uniform particle size between colors to produce higher gloss levels and improved gloss uniformity.

Reduced Bronzing

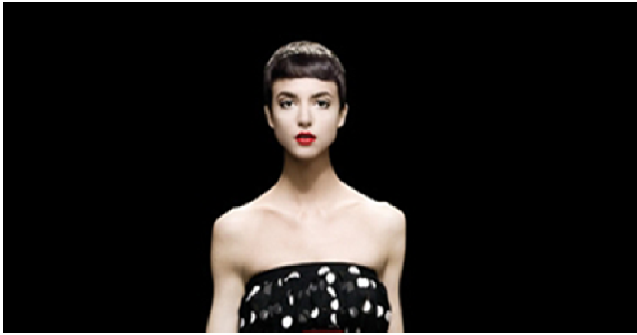
“Bronzing” describes an unwanted metallic luster and changes in perceived density and color that are visible in printed areas at certain angles of view. Bronzing appears on glossy media, and is generally most visible in dark neutral tones and blacks. The image on the right below simulates the effect of severe bronzing.

Bronzing occurs when rays of light pass through the imaging layer, reflect off a smooth (i.e., glossy) substrate, and interfere with each other to produce unwanted colors. Bronzing depends on the thickness of the ink layer, the smoothness of the substrate, the length of the path of the light rays, and the index of refraction of the dried ink film. The blend of polymers in HP Vivid Photo Inks was designed to visibly reduce bronzing.

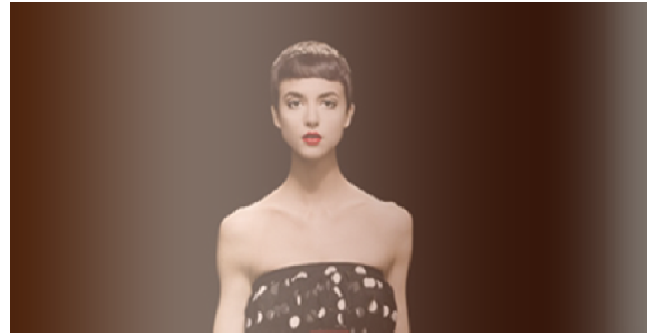
⁴ In the circa 45 countries and territories in which the HP Planet Partners program operates for printing supplies. Program features and availability varies. Where this program is not available, and for other consumables not included in the program, consult the Material Safety Data Sheet (MSDS) available at www.hp.com/go/ecodata to determine appropriate disposal.

⁵ Compared to HP Designjet Z6100 Printers.

⁶ The highlights are the white (unprinted) background of the printing material.



Sample Image



Sample Image with Simulated Bronzing

Image Durability and Permanence

Tests conducted by HP R&D engineers show that prints produced by HP Designjet Z6200 Photo Printers using HP Vivid Photo Inks are about twice as scratch-resistant as those produced by HP 91 Designjet Inks.⁷

HP Vivid Photo Inks produce long-lasting, durable prints with outstanding image quality. Unlaminated prints for interior in-window displays resist fading for over 1 year unlaminated; prints displayed indoors away from direct sunlight resist fading for more than 200 years on a wide range of HP photo papers, matte fine art media, and coated media. HP Vivid Photo Inks can produce water-resistant prints on a range of HP Media.⁸

Reduced Aerosol Generation, Improved Extraction

Drop ejection can produce small trailing droplets that decelerate quickly to form an ink aerosol. This can cause ink accumulation on internal printer components such as the line sensor,⁹ scan axis encoder strip, and the platen. Excessive ink accumulation can degrade performance and require periodic printer maintenance by the user.

HP Vivid Photo Inks are formulated to reduce aerosol generation. This keeps internal components cleaner and reduces printer maintenance requirements.

In addition, the HP 771 Designjet Maintenance Cartridge has been designed to improve aerosol collection with better sealing to the printhead service stations and higher airflow for better aerosol extraction.



With aerosol extraction improved by 3X – 5X,⁵ HP Designjet Z6200 Photo Printers provide more consistent performance and reduce user maintenance. And, aerosol extraction performance is automatically monitored to alert the user when the aerosol extraction fan or aerosol filter must be serviced.

Improved Black Area-Fill Performance on Backlit Materials

HP 771 Designjet Inks produce true neutral tones from white to black.

HP 771 Light Gray Ink is darker than the HP 91 Light Gray Ink used in HP Designjet Z6100 Printers. This change increases black optical density on backlit films to $L^*_{min} = 3.2$ ($D_{max} = 2.64$) from $L^*_{min} = 4.8$ ($D_{max} = 2.39$).¹⁰

Ink aerosol accumulating on printhead orifice plates can misdirect drops to produce banding. With the improved drop ejection performance of HP Vivid Photo Inks, less ink accumulates thereby reducing banding artifacts in the dark areas of backlit films.

Wider Color Gamut

HP Vivid Photo Inks use HP 771 Chromatic Red Ink to extend the gamut in this important color. Although Chromatic Red replaces a dark cyan ink in the HP 771 8-ink system, using a light cyan does not limit the color

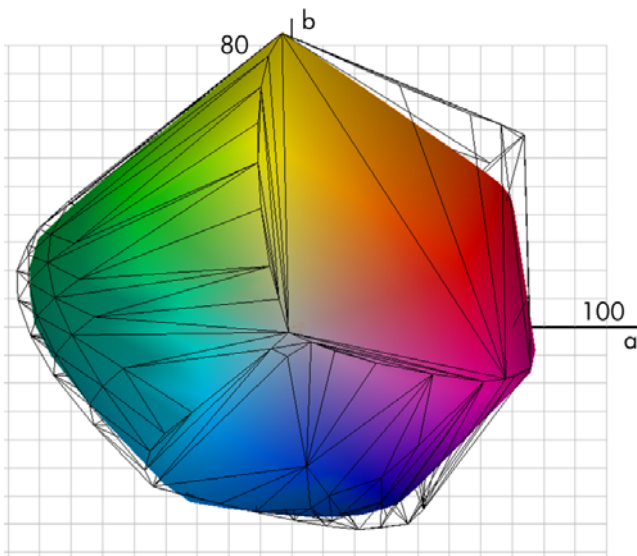
⁷ Based on comparing stylus loads that produced a “scratch-to-white” through an image on HP Premium Instant-dry Photo Gloss Paper.

⁸ Display permanence rating for interior displays/away from direct sunlight by HP Image Permanence Lab, and by Wilhelm Imaging Research, Inc. on a range of HP media. Water resistance and interior in-window display ratings by HP Image Permanence Lab on a range of HP media. For details, visit www.hp.com/go/supplies/printpermanence.

⁹ The Line Sensor, mounted on the printhead carriage, is used for color-to-color alignment, ink linearization, media edge detection, and other functions.

¹⁰ Higher L^*_{min} values are for HP Designjet Z6100 Printers using HP 91 Inks. D_{max} measured on HP Premium Vivid Color Backlit Film in Best print mode. Transmission spectrophotometer measurements according to ISO 5-2. The light source is CIE standard Illuminant A.

gamut on glossy media.⁵ Chromatic Red allows HP771 Magenta Ink to use a new pigment, and these inks offer lower metamerism in reds and magentas⁵



Absolute colorimetric gamuts in CIE L*a*b* color space on HP Premium Instant-dry Photo Gloss Paper are shown at left. The HP Designjet Z6100 Printer gamut is shown in **solid color**; the HP Designjet Z6200 Photo Printer gamut is shown as a **wireframe**.

Extensions of the Z6200 gamut in reds and other colors are seen where the wireframe is outside the solid boundary. The gamut volume for the Z6200 is about 5% larger in cubic CIE L*a*b* units than for the Z6100.¹¹

HP Designjet Z6200 Photo Printers with HP Vivid Photo Inks provide 100% coverage of ISO Coated and SWOP gamuts.¹² A colorimetric match to more than 88% of PANTONE® colors is also achieved.¹³

Improved Ink Efficiency

Ink efficiency is the amount of ink used to produce a print, and it depends on many factors. Changing any factor, such as image to be printed or printing material (media), can have a significant effect on the amount of ink used.

The primary factors affecting ink efficiency are listed below:

- print size
- image to be printed
- printing material
- quality setting
- drop volume per color
- ink formulations
- ink colors
 - colorant loading
 - grays, reds, greens, blues, etc.
- number of inks used
- printer color tables
- halftoning methods
- printer color calibration
- ink limits and printer linearization
- RIP and RIP settings
- ICC profile for inks and media
- printhead testing and servicing routines
- printhead servicing during and between prints

Ink use may be compared between printers by printing the same suite of images while keeping the same as many factors as possible. But, it should be understood that simply changing the printing material affects many other factors, such as number of inks used, printer color tables, ink limits and linearization, ICC Profile, etc..

Ink consumption can be measured by weighing each ink cartridge before and after printing multiple copies of an image. The difference in weight thereby accounts for both the ink used in printing and for servicing the printheads during and between prints.

Results comparing ink consumption between HP Designjet Z6100 and Z6200 Printers are shown in the following charts. The same three (3) sample images, labeled (a) through (c) and with the indicated print sizes, were printed on HP Premium Instant-dry Photo Gloss Paper and HP Heavyweight Coated Paper (HWC).¹⁴ The average results for each media type were computed by equally weighting the ink consumptions for images (a), (b), and (c).

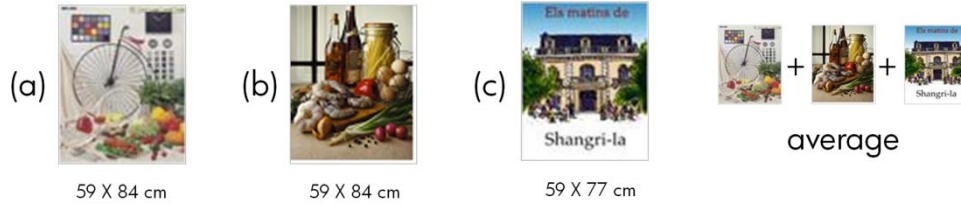
¹¹ Based on Absolute Colorimetric gamuts of 679,694 CIE Lab³ units for the HP Designjet Z6100 Printer and 716,732 CIE Lab³ for the HP Designjet Z6200 Photo Printer on HP Premium Instant-dry Photo Gloss Paper.

¹² Based on testing by HP R&D on HP Premium Instant-dry Photo Gloss Paper.

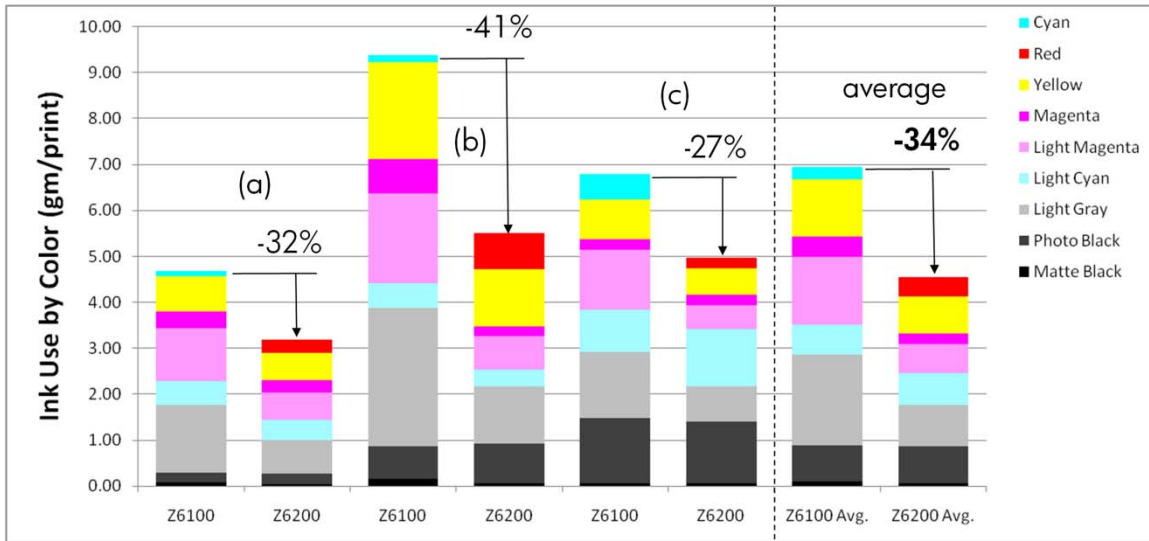
¹³ Preliminary results from HP R&D testing on HP Premium Instant-dry Photo Gloss Paper. Final values to be available after product introduction.

¹⁴ Ink consumption for each image was computed by printing three batches of three copies with ink consumption measured after each batch and averaged. See footnotes (15) and (17) for test conditions. HP R&D uses these (and other) sample images to measure ink consumption and other performance factors during Designjet printer development and for competitive analysis.

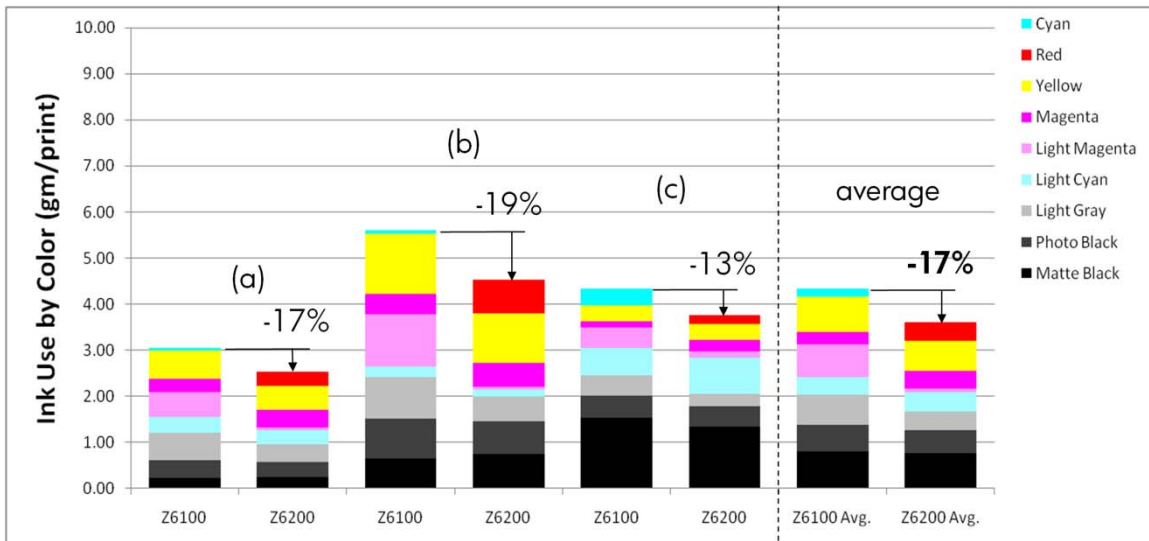
Suite of Sample Images



Ink Efficiency Measurements on Glossy Paper^{15,16} HP Designjet Z6200 Photo Printer compared to HP Designjet Z6100 Printer



Ink Efficiency Measurements on HWC Paper¹⁷ HP Designjet Z6200 Photo Printer compared to HP Designjet Z6100 Printer

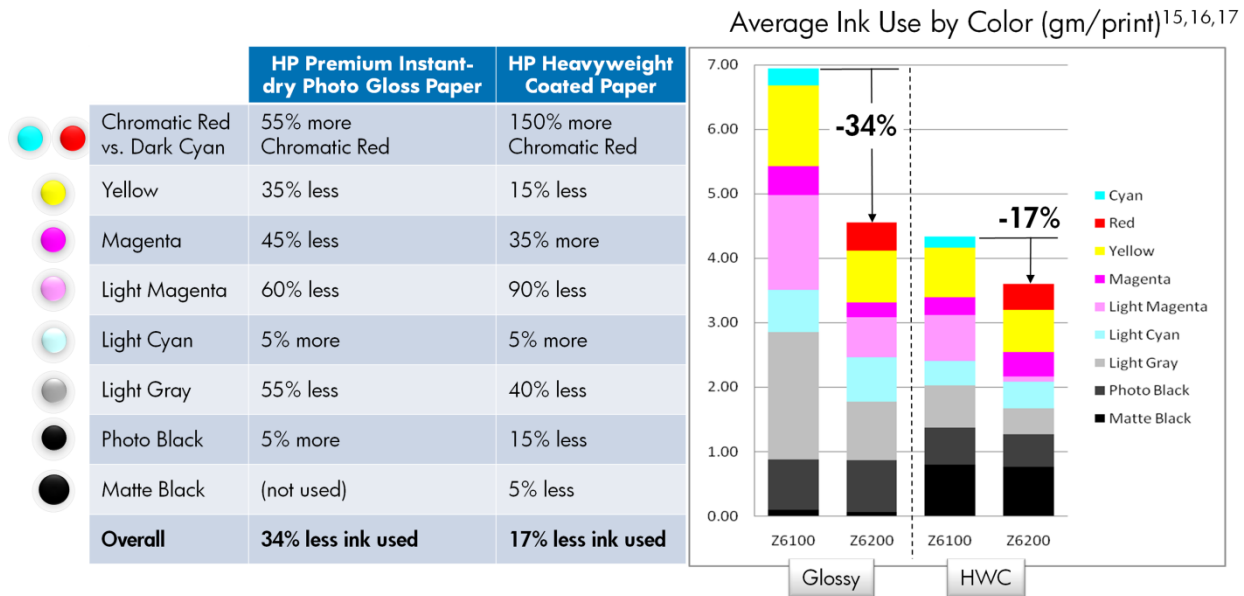


¹⁵ Based on printing the suite of 3 plots as shown on HP Premium Instant-dry Photo Paper, Normal print mode, Relative Colorimetric. Testing by HP R&D compared ink use between HP Designjet Z6100 and Z6200 Printers. These results are for illustrative purposes only. Actual user results may vary. Data as of 8/25/2010.

¹⁶ MK is not used on glossy media or backlit film. All inks are used in printhead servicing while printing.

¹⁷ Based on printing the suite of 3 plots as shown on HP Heavyweight Coated Paper, Normal print mode, Relative Colorimetric. Testing by HP R&D compared ink use between HP Designjet Z6100 and Z6200 Printers. These results are for illustrative purposes only. Actual user results may vary. Data as of 8/25/2010.

The table and figure below summarizes the results in the preceding charts comparing average ink efficiency of an HP Designjet Z6200 Photo Printer to an HP Designjet Z6100 Printer.









These measurements give insight into how ink use depends on image content, printer, inks, and media:¹⁸

- On each paper, comparing results between the images illustrates how total ink use and ink use by color depend on image content.
- Results for a specific image can vary significantly from the average results on a specific paper
 - in the total amount of ink used per print;
 - in the ink use by color;
 - in the differences in ink use between the two printer and ink systems.
- For a specific image as well as average ink use, comparing results between papers illustrates how total ink use and ink use by color depend on the choice of printing material
 - less total ink is used by both printers on HP Heavyweight Coated Paper;¹⁸
- Compared to an HP Designjet Z6100 Printer with HP 91 Designjet Inks, an HP Designjet Z6200 Photo Printer with HP 771 Designjet Inks uses an average of
 - 34% less ink on HP Premium Instant-dry Photo Gloss Paper;¹⁸
 - 17% less ink on HP Heavyweight Coated Paper.¹⁸
- Chromatic Red replaces some Yellow, Magenta, and Light Magenta on glossy paper.
- On the average, eliminating dark cyan ink results in slightly more use of Light Cyan. In Image (c), more Light Cyan is used by the HP Designjet Z6200 Photo Printer on both papers, as expected from the large area of sky blue in this image.

HP Large-Format Printing Materials

HP offers thirty-five (35) printing materials that are compatible with the HP Designjet Z6200 Photo Printer and HP 771 Designjet Inks. Many of these carry certification from the FSC (Forest Stewardship Council) and PEFC (Programme for the Endorsement of Forest Certification) and are recyclable through the HP Large-format Media take-back program (see Note (3) with the table below).

¹⁸ Results are for illustrative purposes only and based on the stated test conditions and suite of three images. User results may vary.

							
Photographic Papers (8)	HP Professional Satin Photo Paper	-	-	-	-	-	-
	HP Premium Matte Photo Paper	-	-	-	-	-	-
	HP Premium Instant-dry Gloss Photo Paper	-	-	-	-	-	(1)
	HP Premium Instant-dry Satin Photo Paper	-	-	-	-	-	(1)
	HP Universal Instant-dry Gloss Photo Paper	-	-	-	✓	-	(1)
	HP Universal Instant-dry Semi-gloss Photo Paper	-	-	-	✓	-	(1)
	HP Everyday Pigment Ink Gloss Photo Paper	-	-	-	✓	-	(1)
HP Everyday Pigment Ink Satin Photo Paper	-	-	-	✓	-	(1)	
Fine Art Printing Materials (5)	HP Professional Matte Canvas	-	-	-	-	-	-
	HP Collector Satin Canvas	-	-	-	-	-	-
	HP Artist Matte Canvas	-	-	-	-	-	-
	HP Universal Matte Canvas	-	-	-	-	-	-
	HP Matte Litho-realistic Paper	-	-	-	-	-	-
Bond and Coated Papers (8)	HP Recycled Bond Paper	-	-	-	-	-	-
	HP Universal Bond Paper	✓	✓	✓	✓	-	(2)
	HP Bright White Inkjet Paper	✓	✓	✓	✓	-	(2)
	HP Coated Paper	-	-	-	✓	-	(2)
	HP Universal Coated Paper	-	-	✓	✓	-	-
	HP Universal Heavyweight Coated Paper	-	-	✓	-	-	(2)
	HP Heavyweight Coated Paper	-	-	-	✓	-	(2)
HP Super Heavyweight Plus Matte Paper	-	-	-	-	-	-	
Technical Papers (3)	HP Natural Tracing Paper	-	-	-	-	-	-
	HP Translucent Bond Paper	-	-	-	-	-	-
	HP Vellum Paper	-	-	-	-	-	-
Graphics/Technical Films (2) and Backlit Materials(1)	HP Clear Film	-	-	-	-	-	(3)
	HP Matte Film	-	-	-	-	-	(3)
	HP Premium Vivid Color Backlit Film	-	-	-	-	-	(3)
Self-Adhesive Materials (3)	HP Everyday Adhesive Matte Polypropylene	-	-	-	-	-	-
	HP Colorfast Adhesive Vinyl	-	-	-	-	-	-
	HP Universal Adhesive Vinyl	-	-	-	-	-	-
Banner and Sign Materials (5)	HP Opaque Scrim	-	-	-	-	-	-
	HP Durable Banner with DuPont™ Tyvek®	-	-	-	-	-	(3)
	HP Everyday Matte Polypropylene, 2-pack	-	-	-	-	-	(3)
	HP Matte Polypropylene	-	-	-	-	-	(3)
	HP Durable Semi-gloss Display Film	-	-	-	-	-	-

(1) Papers can be recycled according to region-specific practices. In North America and Asia (including Japan), recyclable in consumer collection systems that can accept mixed paper (may not be recyclable in your area); in Europe recyclable in consumer collection systems that accept liquid packaging. (2) Can be recycled through commonly available recycle programs. (3) HP offers the HP Large-format Media take-back program in North America and Europe through which most HP recyclable media can be returned, availability varies. For details visit www.hp.com/recycle. Aside from this program, recycling opportunities for these products are currently only available in limited areas. Customers should consult local recycling resources for recycling these products.

Summary

New HP Vivid Photo Inks, introduced with HP Designjet Z6200 Photo Printers, deliver improvements in printer productivity, print quality, and reliability. These reformulated inks feature smaller pigment particles to improve gloss level and uniformity contributing both to image quality and faster throughput. A new blend of polymers nearly doubles scratch resistance, reduces aerosol generation, and improves black area fills on backlit media. And, new pigments give deeper blacks and a larger color gamut while improving ink efficiency.

Using HP Vivid Photo Inks in HP 771 Designjet Ink Cartridges and HP 771 Designjet Printheads, HP Designjet Z6200 Photo Printers produce vivid prints from line drawings to outstanding photographic output and signage to give Print Service Providers a versatile printing solution that can meet their clients' demands for fast print job turnarounds.

For more information

To learn more about HP Designjet Z6200 Photo Printers, visit www.hp.com/go/designjetZ6200

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