

Fade Resistance of HP Premium Photo Paper with HP Photo Printing Systems

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The following chart provides fade resistance resultsⁱ for HP Premium Photo Paper when printed on HP printers and inkjet print cartridges introduced since 2002. In most cases, HP uses Wilhelm Imaging Research, Inc., a leading independent test lab, to substantiate predicted fade resistance claims.

These printers and inkjet print cartridges are designed for sale in the United States, Canada and Latin America.

Printer/Inkjet print cartridge ⁱⁱ	Photo type & cartridges used	Glass-covered Display: ⁱⁱⁱ Years WIR ⁱⁱⁱ , HP ^{iv}
Officejet 7300 & 7400 series Photosmart 325, 375, 2600, 2700, 7850, 8150, 8450, 8750 series printers using these inkjet print cartridges (Note: some cartridges are optional with certain printers): Black: 94 or 96 Tri-color: 95 or 97 Photo color: 99 Photo gray: 100	Color printing with Tri-color only	82 (WIR)
	Color printing with Tri-color and Photo color (6-inks)	~100 – 110 (WIR, test nearly complete)
	Color printing with Tri-color, Photo color and Photo gray (8-inks)	~100 – 110 (HP estimate based on WIR data for similar system)
	B&W/grayscale printing with Photo gray	115 (HP estimate based on WIR data for similar system)
Photosmart 145, 245 printers using these inkjet print cartridges: Tri-color: 57 Photo gray: 59	Color printing with Tri-color	18 (WIR)
	B&W printing with Photo gray	115 (WIR)

Printer/Inkjet print cartridge	Photo type & cartridges used	Glass-covered Display: Years WIR, HP
Photosmart 7600, 7700, 7900, series and PSC 2500 series printers using these inkjet print cartridges: Black: 56 Tri-color: 57 Photo color: 58 Photo gray: 59	Color printing with Tri-color, Photo color and/or with Photo gray	73 (WIR)
	B&W/Grayscale printing with Photo gray	115 (WIR)
<ul style="list-style-type: none"> • Deskjet 450C, 3600, 3800, 5100, 5550, 5600, 5800 and 9600 series • PSC 1350, 2100, 2200, 2300, 2400 series • Photosmart 7150, 7200, 7350, , 7450, 7500 series • Officejet 6110 printers using these inkjet print cartridges: Black: 56 Tri-color: 57 Photo color: 58 	Color printing with Tri-color & Photo color	73 (WIR)
Photosmart 100, 130, 230 printers using the 57 tri-color inkjet print cartridges:	Color printing	18 (WIR)
Officejet 4110, 5510 series printers using only these inkjet cartridges: Black: 56 Tri-color: 57	Color printing	18 (WIR)

Inkjet competitors (printed with HP 57, 58, 59 inkjet print cartridges)

Kodak Premium Picture Paper	Color	10 (HP)
Fujifilm Premium Plus Photo Paper	Color	41 (HP)

Other photo processing methods

Fujicolor Crystal Archive paper – (silver halide)	Color or B&W photos processed from a digital file	40 (WIR)
Kodak Ektacolor Edge Generations paper – (silver halide)		19 (WIR)
Canon CP-200 (dye-sublimation)		7 (WIR)
Sony DPP EX5 (dye-sublimation)		4 (WIR)

Other factors

HP carefully considers all factors related to permanence—not just lightfastness. Other permanence factors include:

- **Thermal Degradation** (also known as dark fade, since it does not require light to occur). HP inkjet colorants are very stable at room temperature—in fact, even after 200 years of simulated storage at 25°C, there is no noticeable change in the colored areas. So the limiting factor is the rate of yellowing of the paper itself. In tests conducted by WIR with HP 57 + HP 58 inkjet print cartridges on HP Premium Plus, the dark fade resistance was found to be over 200 years. HP expects that this 200+ yr. value applies to HP photos made with all current HP inks on either HP Premium or HP Premium Plus photo papers. Confirmation tests are underway at WIR.
- **Air Fade** (or fade caused by airborne pollutant). HP has chosen to use a special, self-sealing inkjet coating on HP Premium and HP Premium Plus photo papers. This coating encapsulates the colors, thereby preventing significant air fade when prints are displayed in regular contact with air. Currently there is no official standard for calculating equivalent years of air fade resistance, but general industry practice used by several major manufacturers allows approximate estimates to be made based on elevated ozone exposure. Based on these tests, all current HP inks with HP Premium or HP premium Plus should have several decades of air fade resistance when displayed in regular contact with air. However, for long-term display it is still preferable to use glass or other protection, since it helps protect the print from various types of unforeseen damage (scratches, smoke particles, etc.).
- **Humidity fastness.** Currently, there is no official standard for calculating equivalent years of display as a function of humidity exposure. However, general industry practice enables identification of products that have poor vs. good resistance to humidity-induced color changes. HP has tested the HP inks listed above on HP Premium and Premium Plus photo papers, and has found the resistance to humidity-induced color changes to be good. However, with all photos—not just inkjet—frequent exposure to high humidity (e.g. above 80 % RH) should be avoided to the extent possible.

ⁱ Results in “covered display” column refer to light fade test results. Degradation by light is not the only factor than can cause photos to fade or distort over time. Clearly specified test standards for the two other factors – humidity and ozone – are currently not defined. However HP IPL and WIR use existing general methods to test for resistance to humidity and ozone. In general, according to tests conducted by HP IPL, the HP products listed in the table show good humidity and ozone resistance. For best results with any photo product, display and store photos in a cool, dry location. For more information on factors that may cause fading refer to “Inkjet Photo Prints: Here to Stay” at www.hp.com/go/premiumplusphoto

ⁱⁱ Printer and inkjet print cartridges listed may not reflect all of the printers available with the inkjet print cartridge configuration listed. Some printer and inkjet print cartridge product numbers vary by region. Some photo cartridges may be optional with certain printers.

ⁱⁱⁱ WIR refers to Wilhelm Imaging Research. WIR Display Permanence Ratings (DPR) are based on accelerated light stability tests conducted at 35 Klux with glass-filtered cool white fluorescent illumination with the sample plane air temperature maintained at 24°C and 60% relative humidity. Data were extrapolated to display conditions of 450 lux for 12 hours per day using the Wilhelm Imaging Research, Inc. “Visually-Weighted Endpoint Criteria Set v3.0.” and represent the years of display for easily noticeable fading, changes in color balance, and/or staining to occur. For more information regarding Wilhelm Imaging Research test methods and conditions please refer to www.wilhelm-research.com/

^{iv} HP IPL refers to HP’s Image Permanence Laboratory. HP IPL test methods closely follows the WIR method. For more information regarding HP IPL test methods and conditions please see “Light fade testing methods: HP Image Permanence Labs and Wilhelm Imaging Research” at www.hp.com/go/premiumplusphoto