

Aardenburg

144



IMAGING & ARCHIVES

Tested System:

ID#:215

Printer: HP Designjet Z3100ps 44"

Inks/Colorants: HP OEM 12-ink Vivera Pigment for Z3100 series printers

Media: Hahnemühle Photo Rag Baryta 315 gsm paper

Coating(s): no additional coating

Sample #: AaI_20101208_SN007

Testing Status: 140 Megalux hours total light exposure

Testing Is ongoing, next update on approximately JULY 15, 2016

Conservation Display Rating (CDR)

Lower limit: passing – evaluation is ongoing

Upper limit: passing – evaluation is ongoing

Note: a CDR with narrow range (typically less than 2:1) indicates relatively even overall fading of the image. A wide range indicates faster fading in certain local colors/tones prior to general fading of most colors/tones in the entire image. Compare ratings for different systems directly and/or use the table on page 2 to estimate time (years) on display.

* Please read document AaI_2009_0118_TA-01.pdf, "An Overview of the AaI&A Conservation Display Ratings", located on the Documents page of the AaI&A website for further explanation of the Conservation display ratings.

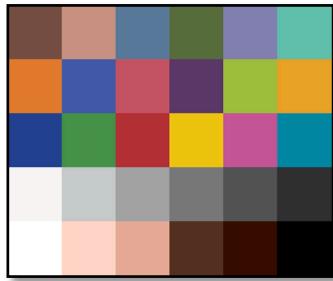
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About this Report

This report contains light fastness information about a sample test print produced by a specific digital printing system. "System" refers to all hardware, software, and materials used to make the finished print. The hardware, software, material components, and printmaker's skills contribute to the final image quality and image permanence. The tested sample is made with current or recently discontinued stocks of commercially available products unless otherwise stated. Each sample has been prepared by Aardenburg Imaging & Archives or one of its members in accordance with customary print making practices unless otherwise noted. The sample may also contain additional finishing materials such as overcoats and laminates which are also noted when used. Finally, the sample has been tested under standardized conditions that are defined on the Sample Description page (see page 4). AaI&A makes every effort to ensure but cannot guarantee that the samples are properly identified and documented and that test results are accurate. For this reason, AaI&A also strives to test independently produced sample replicates in order to increase sampling confidence and to provide information on process variability. Please compare the results in this report to replicate test samples when the data become available.

Understanding this Report



The magnitude and visual appearance of fading depends not only on the chosen printing system but the chosen image as well. In other words, different images are comprised of different colors, and the fading relationships between those colors dictate how the image will look as it fades. The sample print in this test report was made by reproducing the digital image shown on the left. It contains 30 standard colors. 24 of the colors are colorimetrically matched to the Macbeth ColorChecker™ chart viewed under D50 illumination. The remaining six colors supplement the ColorChecker™ array with four additional skin tone colors, one patch for paper white, and another for maximum black. The additional colors also round out the distribution of CIELAB L* (lightness) values in the test target.

Information about the fading characteristics of the product is provided in three ways:

1) You can visually assess the fading. The target images reproduced in this report are digitally reconstructed from the spectrally measured color data rather than scanning or otherwise reproducing the physical print by conventional techniques. This method ensures a colorimetrically accurate representation of the print appearance as the print fades. A calibrated monitor is recommended to experience the best possible reproduction of the test sample appearance. The side-by-side "before and after" presentation of the target images simulates looking at a perfect copy of the unexposed original print along side the same print after light exposure. You can also use Adobe Reader's full screen mode to cycle through the pages and "animate" the fading.

2) I* Color and tonal accuracy scores are reported. This report includes I* metric scores that compare the color and tonal relationships of the light exposed samples to the color and tonal relationships existing in the original print prior to light exposure. Perfect I* scores of 100% can be approached when no significant fading occurs. Average scores above 90% generally indicate excellent retention of original quality, 80% good, 70% fair, etc., but your conclusions may vary depending on your image quality requirements. I* color rates the retained color accuracy (hue and chroma) while I* tone rates the retained tonal accuracy (lightness and contrast). The score is on a percentile scale where 100% is a perfect match between the comparison image (e.g., "after" light exposure) and the reference image (e.g., "before" any light exposure). 0% I* color means no color accuracy is left. 0% I* tone means essentially no tonality remains and all image information content is lost. Negative I* values have significance as well and contribute to the average I* score when they occur. Negative I* color values mean false color has occurred, for example, when a skin tone turns green or a neutral gray becomes distinctly colorful. Negative I* tone scores mean visual contrast between colors has become inverted (i.e., like the tonal relationships in a photographic film negative). Serious image quality problems must arise before false colors and/or tones appear. For more information on the I* metric, please refer to the AaI&A web site.

3) Color changes are also reported using the classic color difference model, ΔE . Note that ΔE values lose perceptual scaling significance when they become large (e.g., > 15). Also, the ΔE equation does not unambiguously measure changes in image contrast. This limitation is generally not a problem for paints and textiles, but can be a serious oversight when evaluating photographic images. Properly tracking changes in image contrast was a major reason behind the development of the I* metric.

Table to Convert Megalux-hours of Light Exposure to estimated “Years on Display” Light Fastness Ratings.

Indoor Light Levels for Print Display		Multiply Mlux-hrs by	Megalux-hours in test									
Light Exposure	Description		10	20	30	40	50	60	70	80	90	100
≤ 10 Lux 24 hours per day	Interior rooms, storage areas, or hallways without windows, illuminated sparingly by artificial lighting	11.42	114	228	342	457	571	685	799	913	1027	1142
50 Lux 12 hours per day	“Museum Standard” display condition	4.57	46	91	137	183	228	274	325	365	411	457
120 Lux 12 hours per day	Average home illumination level for photos is ~ 60 lux. 90% of all displayed photos do not exceed 120 lux (1).	1.90	19	38	57	76	95	114	133	152	171	190
228 Lux 12 hours per day	Relatively bright home or office. Note the simple 1:1 relationship between “years on display” and Mlux-hr values at this condition.	1.00	10	20	30	40	50	60	70	80	90	100
450 Lux 12 hours per day “WIR Display Years” (2) Also equals 500 lux for 11.8 hours per day	A bright home or commercial office building illumination level is 200-500 lux. Also, good illumination for color critical viewing and color matching tasks begins at about 500 lux.	0.51	5	10	15	20	25	30	35	41	46	51
2000 Lux 12 hours per day	Commercial Gallery. Also, critical color evaluation standards call for 2000 lux and a D50 illumination source.	0.114	1.1	2.3	3.4	4.6	5.7	6.8	8.0	9.1	10.3	11.4
5000 Lux 12 hours per day	E.g., Sunlight through a window striking print at an angle.	0.046	0.5	0.9	1.4	1.8	2.3	2.7	3.2	3.7	4.1	4.6
10,000 Lux 12 hours per day	South-facing window in U.S.A. , e.g., storefront display with photos directly facing window.	0.023	0.2	0.5	0.7	0.9	1.1	1.4	1.6	1.8	2.1	2.3
<p>Light levels commonly encountered in the real world fluctuate widely throughout indoor print display environments and produce large variations in how long it takes for artwork to acquire light-induced damage. Use this table as a guide to estimate how many “years on display” (denoted in red text) it takes to accumulate an equivalent light exposure dosage. Review the test results to decide which Megalux-hour dose has caused fading to your level of concern (e.g., just noticeable, easily noticeable, objectionable, etc.). Then choose the “Light Exposure” description that best represents how your print is likely to be displayed. You may want to obtain a lux meter and make some measurements in your own display environment!</p> <p>Note that as the years of display time increase, light-induced fading can be eclipsed by other serious aging mechanisms such as fading and/or staining caused by heat, humidity, and air pollutants. Mould damage can also occur at high humidity. Even when colorants remain water fast, direct contact with liquids may result in physical deformation and staining of the substrate. Also, temperature and especially strong seasonal humidity fluctuations can cause physical cracks and/or flaking, etc., over time. Handling damage such as scratching, abrasion, tears and creases, and catastrophic damage by smoke, fire, flood, etc., also destroy print quality over time. Thus, as illumination levels are reduced other forms of print degradation take on greater probability of occurrence.</p> <p>(1) Eastman Kodak cited this exposure condition with a 90% confidence limit as a rationale for estimating print fading times of traditional color photo materials in typical home display environments. However, for light fading claims regarding its line of pigment-based inkjet printers, Kodak adopted the higher level of 450lux/12 hours per day which is also used by Wilhelm Imaging Research, Inc. (See below).</p> <p>(2) Wilhelm Imaging Research (WIR) standardized its light fastness ratings on 450 lux for 12 hours per day in order to estimate the years on display necessary to reach “easily noticeable” fading. This average daily light exposure dosage, at an assumed 75°F/60%RH temperature and humidity level, has become a de facto industry standard for most industry-sponsored predictive “years of life” light fading estimates in the absence of a published International Standards Organization (ISO) test standard. The table above readily shows how much error occurs in such “print lifetime” predictions as actual real world light levels for prints on display routinely deviate above and below the assumed 450 lux intensity value.</p>												

Sample Description

Sample #	AaI_20101208_SN007	Batch #:	K1
Printer:	HP Designjet Z3100ps 44"		
Ink:	HP OEM 12-ink Vivera Pigment for Z3100 series printers		
Media:	Hahnemühle Photo Rag Baryta 315 gsm paper		
Coating(s):	no additional coating		
Test Print Prepared by:	AaI&A member		
Printed:	December 9, 2010		
Initial Print colors measured	August 10, 2011		
Test Started:	August 11, 2011		
Test Image:	AaI_StandardColorSet(v2)forSRGB.tif		
RIP?Driver settings:	HP driver on Windows XP using Qimage software, rendering resolution = 600ppi, printing resolution = 1200x1200, quality level = best, more passes, application managed colors, gloss enhancer "on".		
Media Setting	n.a.		
Profile:	n.a.	Rendering	perceptual w/bpc
Profile type:	custom		

Paper White Color (UV-included versus UV-excluded)

Optical Brighteners Present? no	L*		a*		b*	
	UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
Media Whitepoint Color	96.0	96.3	0.1	0.1	1.6	1.6
	0.3		0.0		0.0	
<i>UV-inc/UV-exc ΔL*, Δa*, Δb* respectively</i>						
<i>Calculated differences, especially for Δb*, indicate the role and magnitude of fluorescence on original paper color</i>						
Maximum Printed Black	L*	a*	b*	Optical Density (Dmax)		
	9.4	1.1	-1.9	1.98		

Light source: Phillips Colortone F40T12/C50 – 5000°K full spectrum fluorescent. Color rendering Index (CRI) =92), soda lime glass filtered

Light Exposure Cycle: 8 hours on, 4 hours off, twice per 24 hours

CIELAB measurements: D50 2° observer, Xrite Gretag/Macbeth Spectrolino/Spectroscan

Average Illuminance during "on" cycle: 10906 Lux

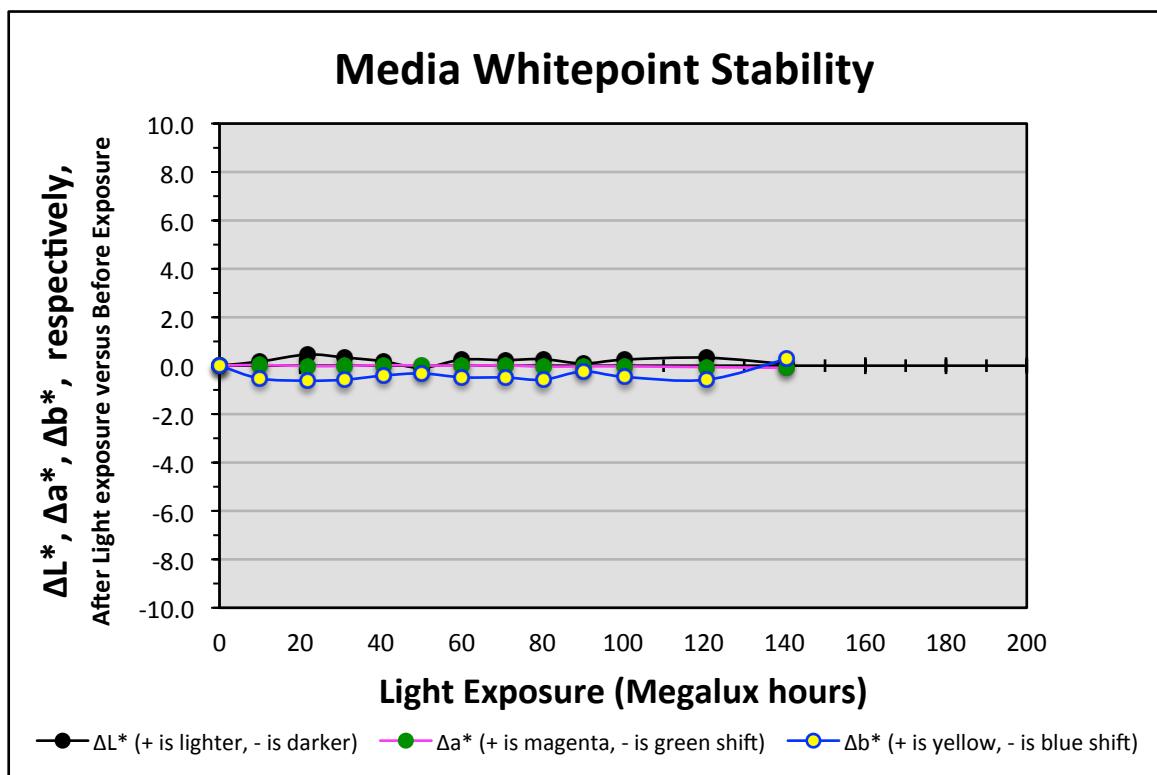
Average Temperature: 23.6°C over full test duration, 25.0°C during light exposure.

Average Relative humidity: 56.7%RH over full test duration, 56.3%RH during light exposure.

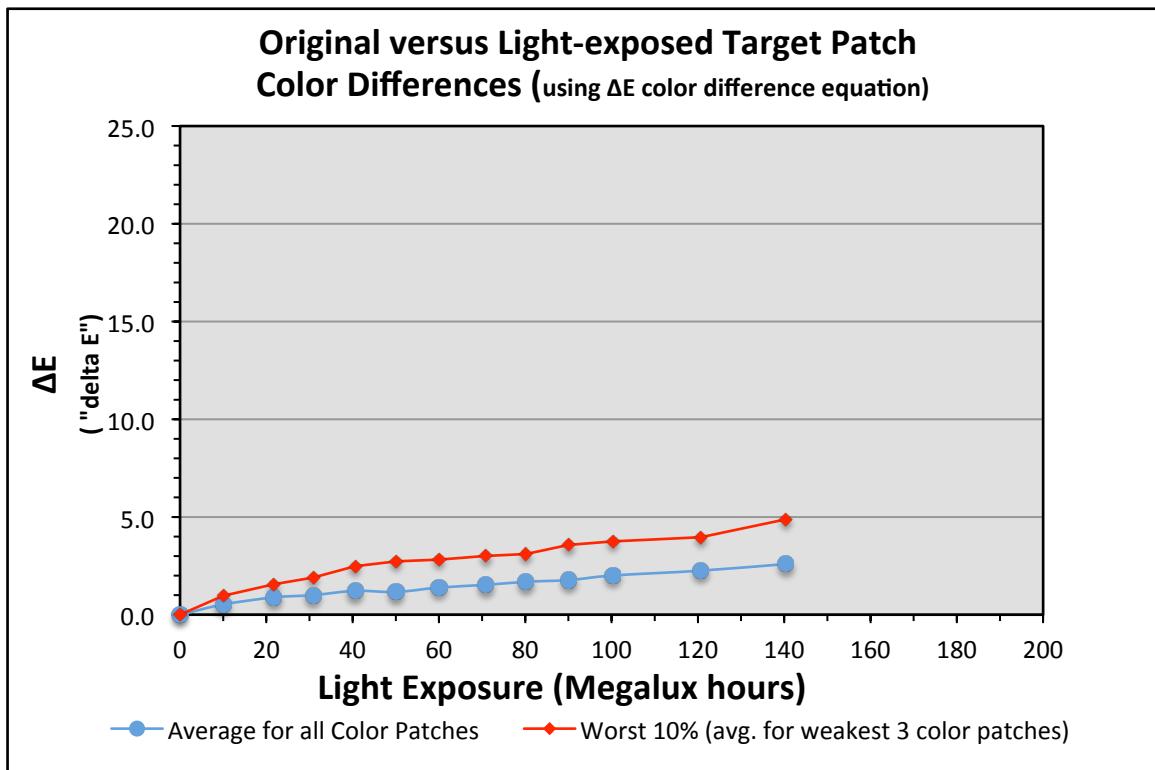
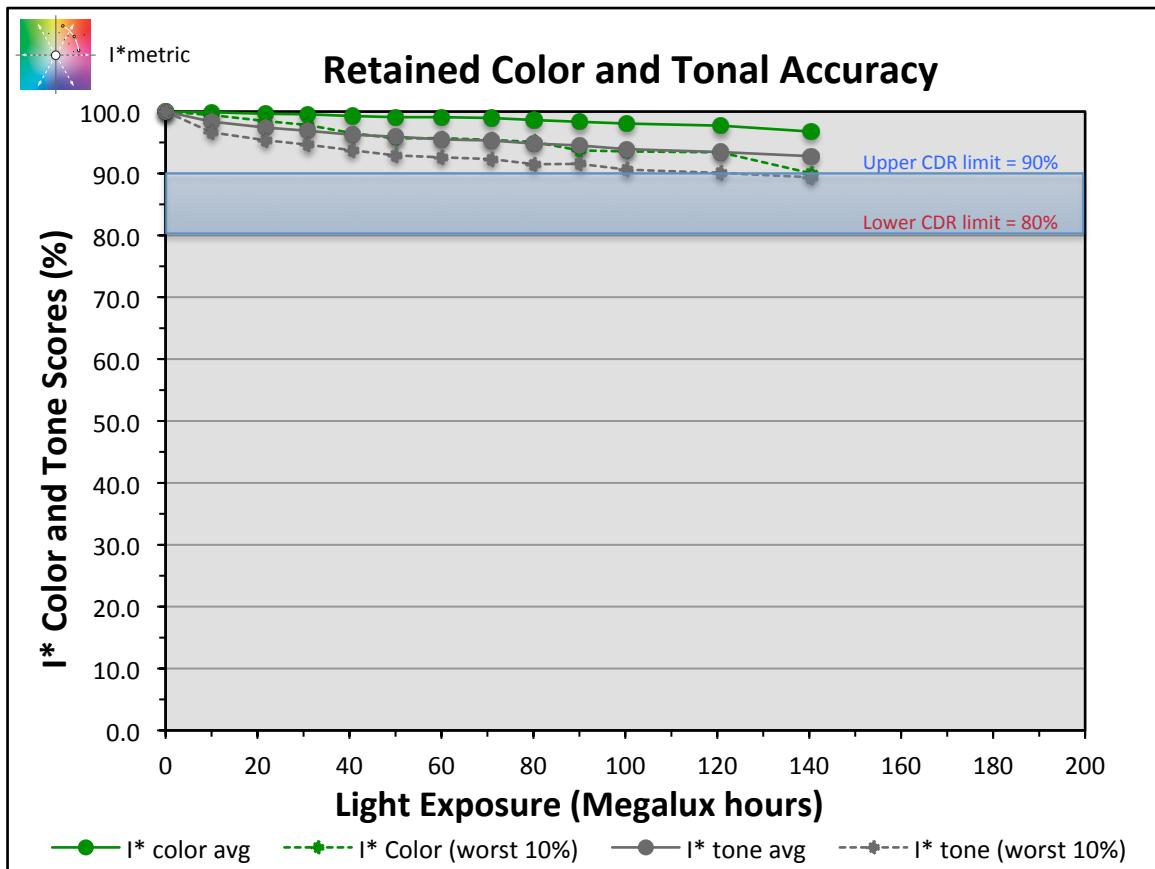
Notes/Comments:

Graphs:

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating



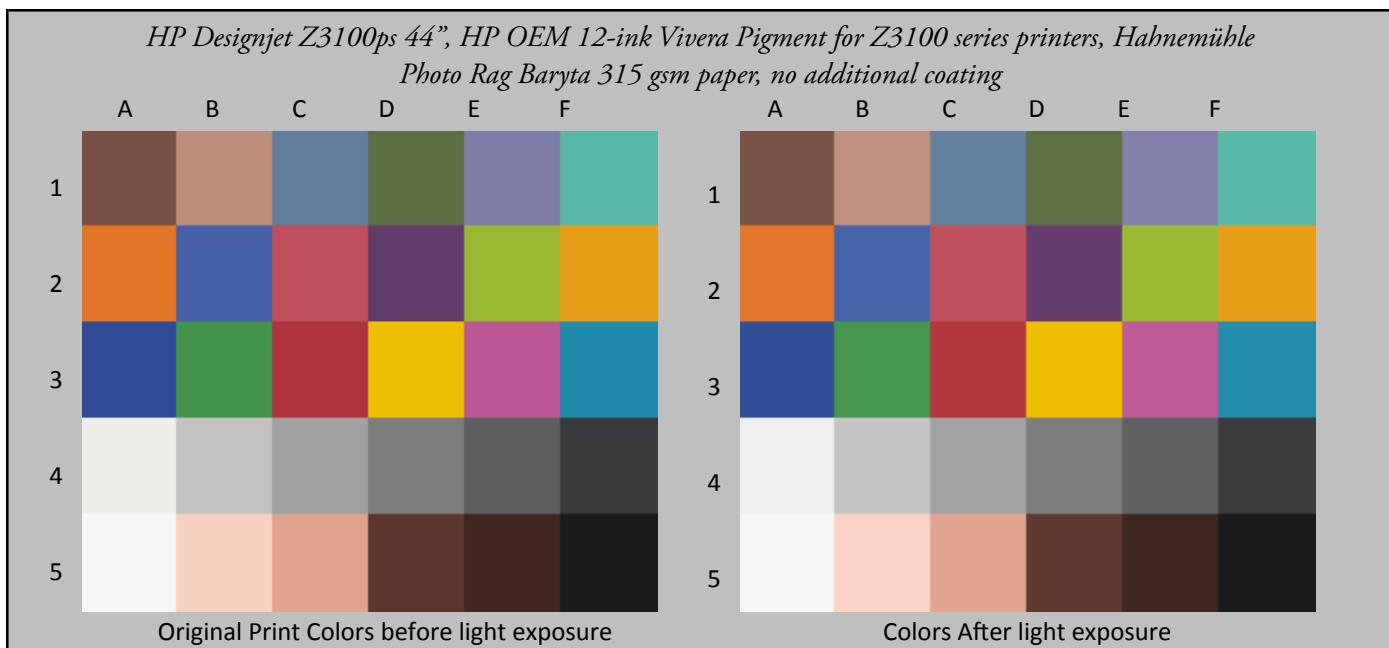
HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating



Values: HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]	1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]
2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]	2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]
3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]	3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]
4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]	4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]
5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]	5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	Before	After	a*	Before	After	a*	Before	After	b*	
A1	Dark Skin	100.0	0.3	38.5	38.8	15.4	15.3	14.1	14.1	14.1	14.1		
B1	Light Skin	100.0	0.5	63.4	63.8	18.2	18.2	16.6	16.4	16.6	16.4		
C1	Blue sky	100.0	0.6	51.2	51.7	-4.5	-4.8	-20.5	-20.4	-20.5	-20.4		
D1	Foliage	100.0	0.5	44.1	44.3	-12.9	-13.1	22.2	22.6	22.2	22.6		
E1	blue flower	99.7	0.8	53.9	54.4	8.3	7.8	-23.3	-23.1	-23.3	-23.1		
F1	bluish green	100.0	0.4	68.6	68.9	-33.3	-33.2	0.1	-0.1	0.1	-0.1		
A1	orange	100.0	0.3	61.6	61.8	38.9	39.1	58.6	58.6	58.6	58.6		
B2	purple blue	99.4	0.9	41.7	42.1	6.5	5.8	-42.1	-41.9	-42.1	-41.9		
C2	moderate red	100.0	0.3	49.2	49.5	45.9	45.9	17.2	17.3	17.2	17.3		
D2	purple	100.0	0.6	31.0	31.5	24.5	24.2	-21.0	-20.9	-21.0	-20.9		
E2	yellow green	100.0	0.6	70.7	70.9	-23.7	-23.8	59.7	60.2	59.7	60.2		
F2	orange yellow	100.0	0.4	70.5	70.8	22.2	22.2	71.1	71.4	71.1	71.4		
A3	blue	99.7	0.7	32.9	33.2	10.2	9.5	-46.0	-46.1	-46.0	-46.1		
B3	green	100.0	0.3	55.3	55.4	-38.3	-38.4	30.6	30.9	30.6	30.9		
C3	red	100.0	0.5	41.6	41.8	51.3	51.6	24.7	25.0	24.7	25.0		
D3	yellow	99.6	0.9	79.1	79.4	7.1	7.0	85.9	86.7	85.9	86.7		
E3	magenta	99.3	1.1	51.3	52.0	46.0	45.4	-13.2	-12.7	-13.2	-12.7		
F3	cyan	100.0	0.5	52.9	53.4	-22.1	-22.2	-25.2	-25.2	-25.2	-25.2		
A4	white	99.8	0.6	94.1	94.4	-0.1	0.1	1.8	1.3	1.8	1.3		
B4	neutral 8	100.0	0.5	78.4	78.8	0.0	0.1	0.7	0.3	0.7	0.3		
C4	neutral 6.5	100.0	0.4	66.4	66.6	0.1	0.0	0.1	-0.2	0.1	-0.2		
D4	neutral 5	100.0	0.3	52.1	52.4	0.7	0.6	0.2	0.1	0.2	0.1		
E4	neutral 3.5	100.0	0.3	40.2	40.5	0.2	0.1	-0.9	-0.9	-0.9	-0.9		
F4	black	100.0	0.2	24.4	24.3	0.2	0.1	-0.9	-0.9	-0.9	-0.9		
A5	paper white	99.7	0.6	96.7	96.9	0.1	0.2	1.3	0.8	1.3	0.8		
B5	Skin highlight L*=88	100.0	0.5	86.9	87.1	12.4	12.3	13.9	13.5	13.9	13.5		
C5	Skin highlight L*=75	100.0	0.4	72.4	72.7	21.2	21.3	19.5	19.3	19.5	19.3		
D5	Skin shadow L*=28	100.0	0.3	27.1	27.2	16.5	16.7	12.4	12.6	12.4	12.6		
E5	Skin shadow L*=13	100.0	0.4	18.7	18.5	10.8	11.0	9.2	9.4	9.2	9.4		
F5	Maximum Black	100.0	1.0	9.4	8.5	1.1	1.0	-1.9	-2.3	-1.9	-2.3		
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		99.9	98.4	0.5									
Worst 10% (3 lowest scoring patches)		99.4	96.6	1.0	10 Megalux hours								

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating											
Original Print Colors before light exposure						Colors After light exposure					
Patch #	Description	I* Color	ΔE	L*		a*		b*		Before	After
				Before	After	Before	After	Before	After		
A1	Dark Skin	100.0	0.7	38.5	39.2	15.4	15.2	14.1	14.0		
B1	Light Skin	100.0	0.8	63.4	64.2	18.2	18.1	16.6	16.4		
C1	Blue sky	100.0	1.2	51.2	52.3	-4.5	-4.9	-20.5	-20.3		
D1	Foliage	100.0	0.7	44.1	44.7	-12.9	-13.0	22.2	22.6		
E1	blue flower	98.6	1.4	53.9	55.0	8.3	7.6	-23.3	-22.8		
F1	bluish green	100.0	0.7	68.6	69.3	-33.3	-33.1	0.1	-0.1		
A1	orange	99.8	0.8	61.6	62.1	38.9	39.0	58.6	58.0		
B2	purple blue	98.4	1.5	41.7	42.7	6.5	5.5	-42.1	-41.6		
C2	moderate red	100.0	0.7	49.2	49.9	45.9	45.8	17.2	17.3		
D2	purple	99.2	1.4	31.0	32.2	24.5	23.9	-21.0	-20.6		
E2	yellow green	99.9	0.8	70.7	71.2	-23.7	-23.8	59.7	60.2		
F2	orange yellow	100.0	0.5	70.5	71.0	22.2	22.1	71.1	71.1		
A3	blue	98.6	1.4	32.9	33.8	10.2	9.1	-46.0	-45.7		
B3	green	100.0	0.8	55.3	55.9	-38.3	-38.3	30.6	31.1		
C3	red	100.0	0.6	41.6	42.1	51.3	51.5	24.7	24.9		
D3	yellow	99.6	0.9	79.1	79.6	7.1	6.8	85.9	86.6		
E3	magenta	98.4	1.7	51.3	52.5	46.0	45.1	-13.2	-12.4		
F3	cyan	100.0	1.0	52.9	53.9	-22.1	-22.3	-25.2	-25.3		
A4	white	98.8	0.8	94.1	94.6	-0.1	-0.1	1.8	1.2		
B4	neutral 8	99.8	0.9	78.4	79.2	0.0	0.0	0.7	0.2		
C4	neutral 6.5	100.0	0.8	66.4	66.9	0.1	-0.2	0.1	-0.3		
D4	neutral 5	100.0	0.8	52.1	52.9	0.7	0.5	0.2	0.1		
E4	neutral 3.5	100.0	0.9	40.2	41.1	0.2	0.0	-0.9	-1.0		
F4	black	100.0	0.6	24.4	25.0	0.2	0.1	-0.9	-0.8		
A5	paper white	98.7	0.8	96.7	97.2	0.1	0.1	1.3	0.7		
B5	Skin highlight L*=88	99.5	0.9	86.9	87.6	12.4	12.1	13.9	13.4		
C5	Skin highlight L*=75	100.0	0.8	72.4	73.2	21.2	21.2	19.5	19.2		
D5	Skin shadow L*=28	100.0	0.8	27.1	27.9	16.5	16.3	12.4	12.4		
E5	Skin shadow L*=13	100.0	0.3	18.7	19.0	10.8	10.8	9.2	9.3		
F5	Maximum Black	100.0	0.5	9.4	9.1	1.1	1.1	-1.9	-2.3		
Summary Results		I* Color	I* tone	ΔE							
Average Score for all patches		99.6	97.4	0.9							
Worst 10% (3 lowest scoring patches)		98.5	95.4	1.6	20 Megalux hours						

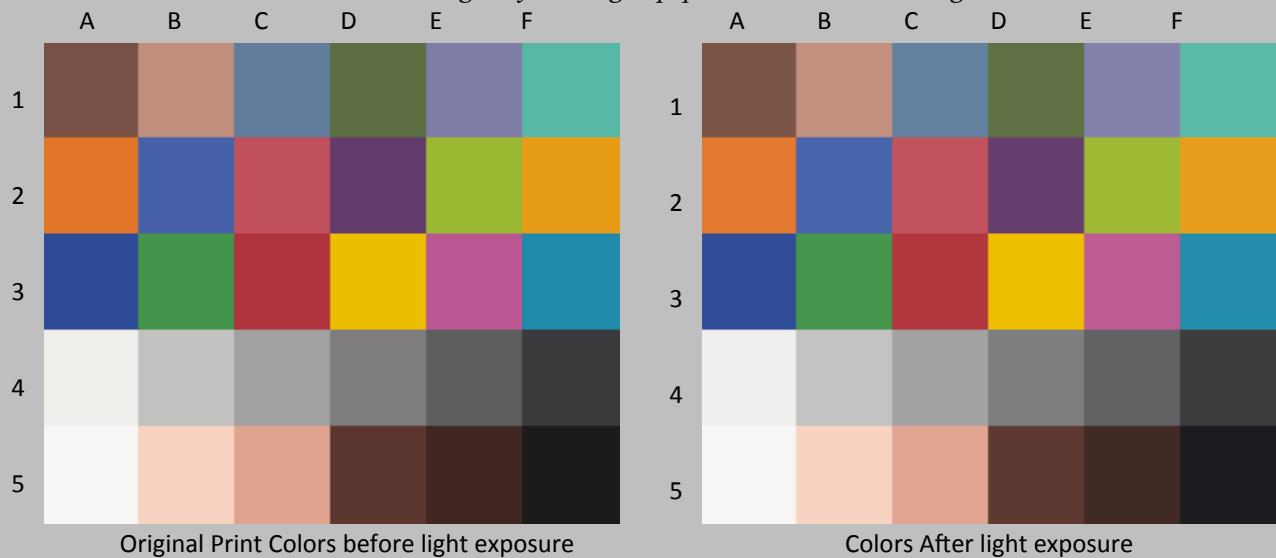
HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	100.0	0.9	38.5	39.3	15.4	15.2	14.1	13.9
B1	Light Skin	100.0	0.9	63.4	64.3	18.2	18.0	16.6	16.4
C1	Blue sky	99.6	1.4	51.2	52.5	-4.5	-4.9	-20.5	-20.1
D1	Foliage	100.0	0.9	44.1	44.9	-12.9	-12.9	22.2	22.4
E1	blue flower	98.0	1.7	53.9	55.3	8.3	7.6	-23.3	-22.6
F1	bluish green	100.0	0.8	68.6	69.3	-33.3	-32.9	0.1	-0.2
A1	orange	99.4	1.1	61.6	62.2	38.9	39.0	58.6	57.7
B2	purplish blue	97.7	1.9	41.7	42.8	6.5	5.3	-42.1	-41.3
C2	moderate red	100.0	0.9	49.2	50.0	45.9	45.7	17.2	17.4
D2	purple	98.5	1.7	31.0	32.4	24.5	23.8	-21.0	-20.3
E2	yellow green	100.0	0.7	70.7	71.3	-23.7	-23.7	59.7	60.0
F2	orange yellow	100.0	0.7	70.5	71.1	22.2	22.0	71.1	70.8
A3	blue	98.1	1.8	32.9	34.0	10.2	9.0	-46.0	-45.4
B3	green	100.0	0.8	55.3	55.9	-38.3	-38.1	30.6	30.9
C3	red	100.0	0.7	41.6	42.3	51.3	51.3	24.7	24.8
D3	yellow	100.0	0.6	79.1	79.6	7.1	6.8	85.9	86.1
E3	magenta	97.8	2.1	51.3	52.6	46.0	44.9	-13.2	-12.1
F3	cyan	100.0	1.1	52.9	54.0	-22.1	-22.2	-25.2	-25.1
A4	white	99.4	0.7	94.1	94.5	-0.1	0.0	1.8	1.2
B4	neutral 8	100.0	0.8	78.4	79.1	0.0	0.0	0.7	0.2
C4	neutral 6.5	100.0	0.7	66.4	66.9	0.1	-0.1	0.1	-0.3
D4	neutral 5	100.0	0.8	52.1	52.9	0.7	0.5	0.2	0.1
E4	neutral 3.5	100.0	1.2	40.2	41.3	0.2	0.1	-0.9	-0.9
F4	black	100.0	1.0	24.4	25.4	0.2	0.2	-0.9	-0.7
A5	paper white	99.2	0.7	96.7	97.1	0.1	0.1	1.3	0.8
B5	Skin highlight L*=88	99.6	0.8	86.9	87.6	12.4	12.1	13.9	13.4
C5	Skin highlight L* =75	100.0	1.0	72.4	73.3	21.2	21.2	19.5	19.2
D5	Skin shadow L*=28	100.0	1.0	27.1	28.1	16.5	16.3	12.4	12.3
E5	Skin shadow L*=13	100.0	0.6	18.7	19.3	10.8	10.7	9.2	9.2
F5	Maximum Black	100.0	0.3	9.4	9.5	1.1	1.2	-1.9	-2.1
Summary Results		I* Color	I* tone	ΔE					
Average Score for all patches		99.6	96.9	1.0					
Worst 10% (3 lowest scoring patches)		97.8	94.7	1.9					

30 Megalux hours

*HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle
Photo Rag Baryta 315 gsm paper, no additional coating*



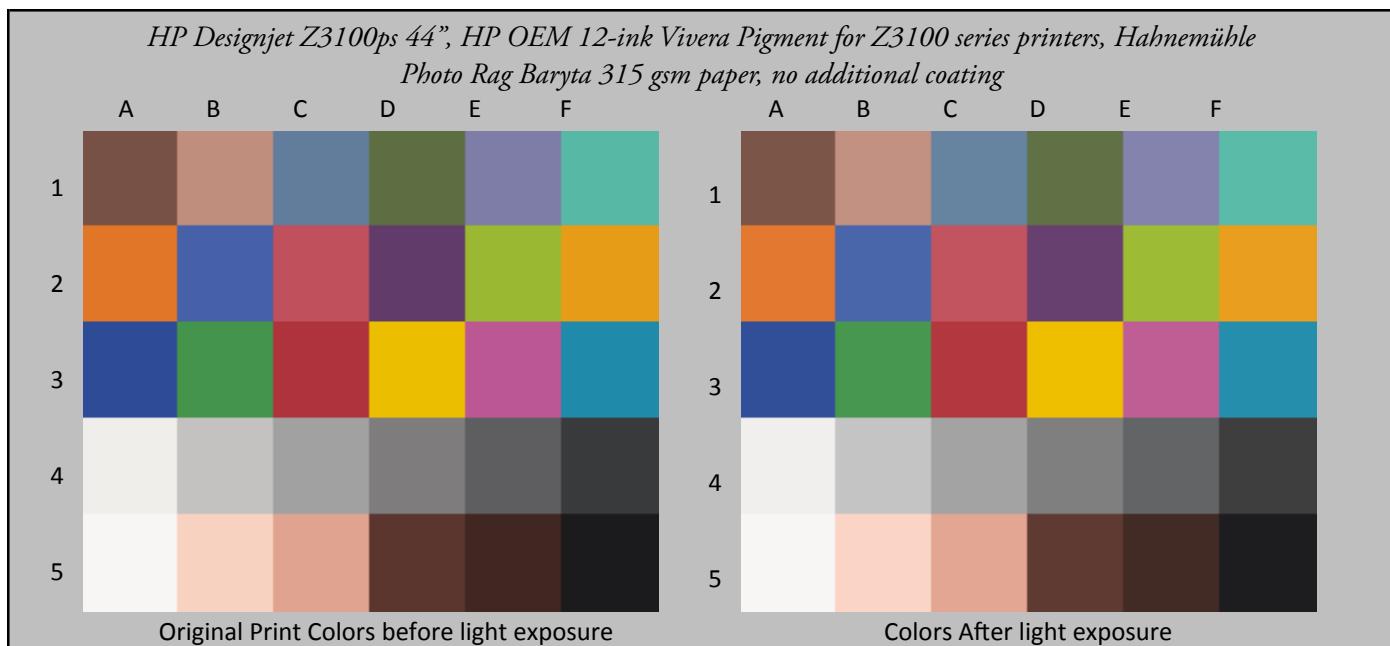
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	100.0	1.2	38.5	39.6	15.4	15.0	14.1	13.9
B1	Light Skin	100.0	1.0	63.4	64.4	18.2	18.0	16.6	16.5
C1	Blue sky	97.5	1.8	51.2	52.7	-4.5	-4.8	-20.5	-19.5
D1	Foliage	100.0	1.0	44.1	45.1	-12.9	-12.7	22.2	22.2
E1	blue flower	96.4	2.2	53.9	55.6	8.3	7.6	-23.3	-22.1
F1	bluish green	99.7	0.9	68.6	69.4	-33.3	-32.7	0.1	0.0
A1	orange	98.6	1.6	61.6	62.2	38.9	38.8	58.6	57.2
B2	purple blue	96.5	2.4	41.7	43.0	6.5	5.1	-42.1	-40.8
C2	moderate red	99.7	1.1	49.2	50.1	45.9	45.4	17.2	17.5
D2	purple	97.0	2.3	31.0	32.8	24.5	23.6	-21.0	-19.9
E2	yellow green	100.0	0.7	70.7	71.3	-23.7	-23.5	59.7	59.7
F2	orange yellow	99.7	0.9	70.5	71.1	22.2	21.9	71.1	70.5
A3	blue	96.7	2.5	32.9	34.3	10.2	8.6	-46.0	-44.8
B3	green	99.9	1.0	55.3	56.0	-38.3	-37.8	30.6	30.9
C3	red	100.0	0.8	41.6	42.4	51.3	51.2	24.7	24.8
D3	yellow	100.0	0.5	79.1	79.6	7.1	6.8	85.9	85.9
E3	magenta	96.7	2.6	51.3	52.8	46.0	44.6	-13.2	-11.7
F3	cyan	100.0	1.3	52.9	54.1	-22.1	-22.2	-25.2	-24.8
A4	white	100.0	0.4	94.1	94.4	-0.1	0.0	1.8	1.4
B4	neutral 8	100.0	0.6	78.4	79.0	0.0	0.0	0.7	0.4
C4	neutral 6.5	100.0	0.6	66.4	66.9	0.1	-0.1	0.1	-0.1
D4	neutral 5	100.0	1.0	52.1	53.1	0.7	0.5	0.2	0.2
E4	neutral 3.5	100.0	1.4	40.2	41.6	0.2	0.1	-0.9	-0.8
F4	black	100.0	1.5	24.4	25.9	0.2	0.2	-0.9	-0.5
A5	paper white	100.0	0.4	96.7	96.9	0.1	0.2	1.3	0.9
B5	Skin highlight L*=88	100.0	0.8	86.9	87.5	12.4	12.1	13.9	13.5
C5	Skin highlight L*=75	100.0	1.0	72.4	73.4	21.2	21.1	19.5	19.2
D5	Skin shadow L*=28	100.0	1.3	27.1	28.4	16.5	16.1	12.4	12.2
E5	Skin shadow L*=13	100.0	1.1	18.7	19.7	10.8	10.5	9.2	9.2
F5	Maximum Black	100.0	0.7	9.4	10.1	1.1	1.2	-1.9	-1.9
Summary Results		I* Color	I* tone	ΔE					
Average Score for all patches		99.3	96.3	1.2					
Worst 10% (3 lowest scoring patches)		96.5	93.7	2.5	40 Megalux hours				

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]	1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]
2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]	2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]
3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]	3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]
4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]	4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]
5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]	5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	Before	After	a*	Before	After	a*	Before	After	b*	
A1	Dark Skin	100.0	1.2	38.5	39.6	15.4	15.0	14.1	13.8				
B1	Light Skin	100.0	1.0	63.4	64.4	18.2	18.0	16.6	16.5				
C1	Blue sky	97.6	1.8	51.2	52.7	-4.5	-4.9	-20.5	-19.6				
D1	Foliage	100.0	0.9	44.1	45.0	-12.9	-12.8	22.2	22.3				
E1	blue flower	95.5	2.3	53.9	55.5	8.3	7.5	-23.3	-21.9				
F1	bluish green	99.7	0.8	68.6	69.2	-33.3	-32.7	0.1	0.1				
A1	orange	98.2	1.8	61.6	62.0	38.9	38.8	58.6	56.9				
B2	purple blue	95.7	2.7	41.7	43.0	6.5	4.9	-42.1	-40.5				
C2	moderate red	99.6	1.0	49.2	50.0	45.9	45.4	17.2	17.6				
D2	purple	96.3	2.4	31.0	32.7	24.5	23.5	-21.0	-19.7				
E2	yellow green	100.0	0.5	70.7	71.2	-23.7	-23.4	59.7	59.7				
F2	orange yellow	99.5	1.0	70.5	71.0	22.2	21.9	71.1	70.3				
A3	blue	95.8	2.8	32.9	34.2	10.2	8.3	-46.0	-44.4				
B3	green	99.5	0.9	55.3	55.8	-38.3	-37.6	30.6	30.7				
C3	red	100.0	0.7	41.6	42.3	51.3	51.1	24.7	24.7				
D3	yellow	100.0	0.4	79.1	79.4	7.1	6.8	85.9	85.9				
E3	magenta	96.1	2.7	51.3	52.7	46.0	44.5	-13.2	-11.4				
F3	cyan	99.4	1.3	52.9	54.0	-22.1	-22.2	-25.2	-24.5				
A4	white	100.0	0.2	94.1	94.2	-0.1	0.0	1.8	1.6				
B4	neutral 8	100.0	0.4	78.4	78.8	0.0	0.0	0.7	0.5				
C4	neutral 6.5	100.0	0.5	66.4	66.7	0.1	-0.2	0.1	-0.1				
D4	neutral 5	100.0	0.7	52.1	52.7	0.7	0.4	0.2	0.1				
E4	neutral 3.5	100.0	1.3	40.2	41.4	0.2	0.0	-0.9	-0.8				
F4	black	100.0	1.4	24.4	25.8	0.2	0.2	-0.9	-0.5				
A5	paper white	100.0	0.3	96.7	96.6	0.1	0.1	1.3	1.0				
B5	Skin highlight L*=88	99.9	0.6	86.9	87.3	12.4	12.1	13.9	13.5				
C5	Skin highlight L*=75	100.0	0.8	72.4	73.2	21.2	21.1	19.5	19.3				
D5	Skin shadow L*=28	100.0	1.1	27.1	28.2	16.5	16.2	12.4	12.2				
E5	Skin shadow L*=13	100.0	0.9	18.7	19.6	10.8	10.5	9.2	9.2				
F5	Maximum Black	100.0	0.5	9.4	9.9	1.1	1.2	-1.9	-1.9				
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		99.1	96.0	1.2									
Worst 10% (3 lowest scoring patches)		95.7	92.9	2.7									
50 Megalux hours													

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]	1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]
2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]	2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]
3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]	3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]
4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]	4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]
5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]	5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	Before	After	a*	Before	After	a*	b*	Before	After	
A1	Dark Skin	100.0	1.3	38.5	39.7	15.4	15.0	14.1	13.8				
B1	Light Skin	100.0	1.1	63.4	64.5	18.2	18.0	16.6	16.5				
C1	Blue sky	97.7	2.0	51.2	52.9	-4.5	-4.9	-20.5	-19.6				
D1	Foliage	100.0	1.1	44.1	45.2	-12.9	-12.7	22.2	22.4				
E1	blue flower	95.5	2.5	53.9	55.8	8.3	7.5	-23.3	-21.9				
F1	bluish green	99.6	1.1	68.6	69.5	-33.3	-32.7	0.1	0.0				
A1	orange	98.0	2.0	61.6	62.2	38.9	39.0	58.6	56.8				
B2	purple blue	95.7	2.8	41.7	43.2	6.5	4.9	-42.1	-40.5				
C2	moderate red	99.9	1.1	49.2	50.2	45.9	45.5	17.2	17.5				
D2	purple	96.5	2.7	31.0	33.1	24.5	23.5	-21.0	-19.7				
E2	yellow green	100.0	0.7	70.7	71.4	-23.7	-23.5	59.7	59.8				
F2	orange yellow	99.4	1.1	70.5	71.1	22.2	21.9	71.1	70.2				
A3	blue	95.9	2.9	32.9	34.4	10.2	8.3	-46.0	-44.5				
B3	green	99.6	1.1	55.3	56.1	-38.3	-37.7	30.6	30.8				
C3	red	100.0	0.8	41.6	42.4	51.3	51.2	24.7	24.6				
D3	yellow	100.0	0.6	79.1	79.6	7.1	6.8	85.9	86.1				
E3	magenta	96.4	2.8	51.3	53.0	46.0	44.7	-13.2	-11.5				
F3	cyan	99.6	1.5	52.9	54.3	-22.1	-22.1	-25.2	-24.6				
A4	white	100.0	0.5	94.1	94.4	-0.1	0.0	1.8	1.4				
B4	neutral 8	100.0	0.8	78.4	79.2	0.0	0.0	0.7	0.4				
C4	neutral 6.5	100.0	0.7	66.4	67.0	0.1	-0.1	0.1	-0.2				
D4	neutral 5	100.0	1.1	52.1	53.2	0.7	0.4	0.2	0.1				
E4	neutral 3.5	100.0	1.7	40.2	41.8	0.2	0.0	-0.9	-0.8				
F4	black	100.0	1.7	24.4	26.0	0.2	0.2	-0.9	-0.4				
A5	paper white	100.0	0.5	96.7	97.0	0.1	0.1	1.3	0.9				
B5	Skin highlight L*=88	99.0	1.0	86.9	87.7	12.4	12.0	13.9	13.3				
C5	Skin highlight L*=75	100.0	1.2	72.4	73.6	21.2	21.2	19.5	19.1				
D5	Skin shadow L*=28	99.7	1.6	27.1	28.7	16.5	16.0	12.4	12.1				
E5	Skin shadow L*=13	100.0	1.1	18.7	19.8	10.8	10.5	9.2	9.0				
F5	Maximum Black	100.0	0.6	9.4	10.0	1.1	1.2	-1.9	-1.8				
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		99.1	95.5	1.4									
Worst 10% (3 lowest scoring patches)		95.7	92.6	2.8	60 Megalux hours								

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]	1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]
2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]	2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]
3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]	3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]
4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]	4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]
5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]	5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	Before	After	a*	Before	After	a*	Before	After	b*	
A1	Dark Skin	99.5	1.5	38.5	39.9	15.4	14.9	14.1	13.7				
B1	Light Skin	100.0	1.3	63.4	64.7	18.2	18.0	16.6	16.4				
C1	Blue sky	97.4	2.1	51.2	53.0	-4.5	-4.9	-20.5	-19.5				
D1	Foliage	100.0	1.3	44.1	45.4	-12.9	-12.7	22.2	22.3				
E1	blue flower	95.1	2.6	53.9	55.9	8.3	7.5	-23.3	-21.8				
F1	bluish green	99.4	1.2	68.6	69.6	-33.3	-32.6	0.1	0.0				
A1	orange	97.6	2.2	61.6	62.3	38.9	39.0	58.6	56.5				
B2	purple blue	95.4	3.0	41.7	43.3	6.5	4.8	-42.1	-40.4				
C2	moderate red	99.9	1.2	49.2	50.3	45.9	45.5	17.2	17.5				
D2	purple	96.3	2.8	31.0	33.2	24.5	23.6	-21.0	-19.6				
E2	yellow green	100.0	0.9	70.7	71.5	-23.7	-23.5	59.7	59.8				
F2	orange yellow	99.2	1.3	70.5	71.2	22.2	21.9	71.1	70.0				
A3	blue	95.8	3.0	32.9	34.5	10.2	8.3	-46.0	-44.4				
B3	green	99.5	1.2	55.3	56.1	-38.3	-37.6	30.6	30.8				
C3	red	100.0	0.9	41.6	42.6	51.3	51.3	24.7	24.6				
D3	yellow	100.0	0.7	79.1	79.7	7.1	6.7	85.9	86.2				
E3	magenta	96.0	3.1	51.3	53.2	46.0	44.5	-13.2	-11.4				
F3	cyan	99.3	1.7	52.9	54.4	-22.1	-22.1	-25.2	-24.5				
A4	white	100.0	0.5	94.1	94.5	-0.1	0.0	1.8	1.4				
B4	neutral 8	100.0	0.9	78.4	79.3	0.0	0.0	0.7	0.4				
C4	neutral 6.5	100.0	0.8	66.4	67.1	0.1	-0.1	0.1	-0.2				
D4	neutral 5	100.0	1.2	52.1	53.3	0.7	0.4	0.2	0.1				
E4	neutral 3.5	100.0	1.8	40.2	41.9	0.2	0.0	-0.9	-0.8				
F4	black	99.8	1.6	24.4	26.0	0.2	0.3	-0.9	-0.3				
A5	paper white	100.0	0.5	96.7	96.9	0.1	0.1	1.3	0.9				
B5	Skin highlight L*=88	98.7	1.1	86.9	87.8	12.4	12.0	13.9	13.3				
C5	Skin highlight L*=75	100.0	1.3	72.4	73.7	21.2	21.1	19.5	19.1				
D5	Skin shadow L*=28	100.0	1.6	27.1	28.7	16.5	16.1	12.4	12.1				
E5	Skin shadow L*=13	100.0	1.4	18.7	20.1	10.8	10.5	9.2	9.3				
F5	Maximum Black	100.0	1.1	9.4	10.4	1.1	1.4	-1.9	-1.6				
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		99.0	95.3	1.5									
Worst 10% (3 lowest scoring patches)		95.4	92.3	3.0	70 Megalux hours								

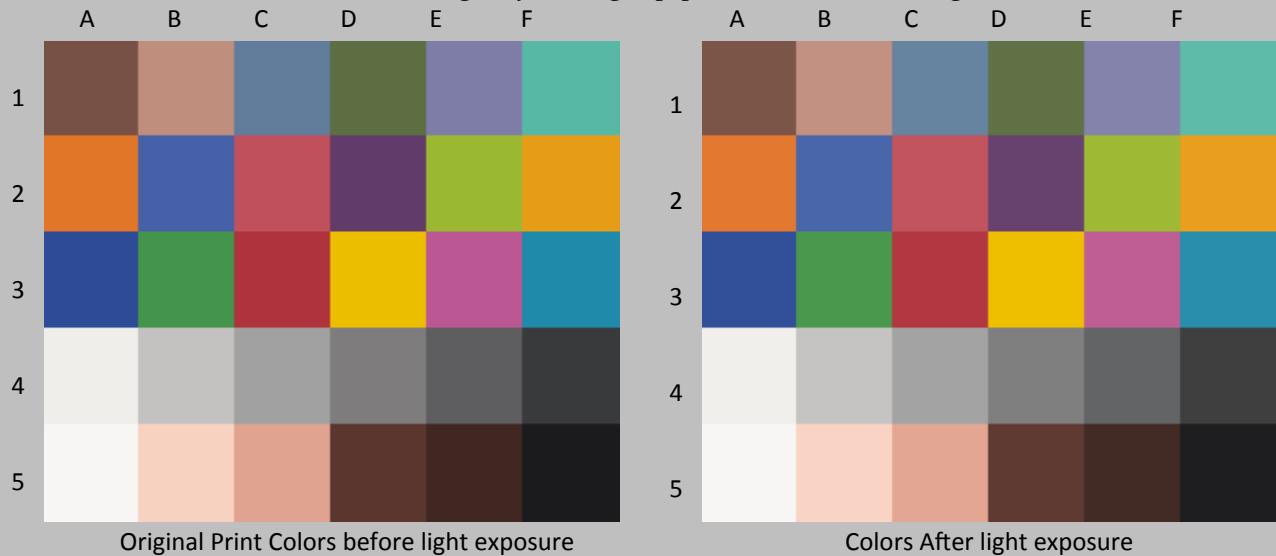
HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	99.0	1.7	38.5	40.0	15.4	14.8	14.1	13.7
B1	Light Skin	100.0	1.4	63.4	64.8	18.2	17.8	16.6	16.4
C1	Blue sky	96.9	2.4	51.2	53.3	-4.5	-5.0	-20.5	-19.5
D1	Foliage	100.0	1.5	44.1	45.5	-12.9	-12.8	22.2	22.3
E1	blue flower	94.5	2.9	53.9	56.1	8.3	7.4	-23.3	-21.7
F1	bluish green	99.2	1.3	68.6	69.7	-33.3	-32.6	0.1	-0.1
A1	orange	97.3	2.5	61.6	62.4	38.9	38.8	58.6	56.3
B2	purplish blue	95.2	3.1	41.7	43.5	6.5	4.7	-42.1	-40.3
C2	moderate red	99.7	1.4	49.2	50.4	45.9	45.3	17.2	17.4
D2	purple	96.4	2.9	31.0	33.4	24.5	23.5	-21.0	-19.7
E2	yellow green	100.0	1.0	70.7	71.6	-23.7	-23.6	59.7	59.6
F2	orange yellow	98.9	1.5	70.5	71.3	22.2	21.8	71.1	69.9
A3	blue	95.6	3.1	32.9	34.7	10.2	8.1	-46.0	-44.5
B3	green	99.7	1.3	55.3	56.4	-38.3	-37.7	30.6	30.7
C3	red	100.0	1.0	41.6	42.6	51.3	51.2	24.7	24.5
D3	yellow	99.9	0.8	79.1	79.7	7.1	6.6	85.9	86.2
E3	magenta	96.0	3.0	51.3	53.2	46.0	44.5	-13.2	-11.4
F3	cyan	99.5	1.8	52.9	54.5	-22.1	-22.2	-25.2	-24.6
A4	white	100.0	0.6	94.1	94.5	-0.1	-0.1	1.8	1.3
B4	neutral 8	100.0	0.9	78.4	79.2	0.0	-0.1	0.7	0.3
C4	neutral 6.5	98.8	1.0	66.4	67.2	0.1	-0.4	0.1	-0.2
D4	neutral 5	98.6	1.4	52.1	53.4	0.7	0.1	0.2	0.0
E4	neutral 3.5	99.5	2.2	40.2	42.3	0.2	-0.3	-0.9	-0.8
F4	black	98.9	2.1	24.4	26.5	0.2	0.0	-0.9	-0.3
A5	paper white	99.1	0.6	96.7	97.0	0.1	0.1	1.3	0.8
B5	Skin highlight L*=88	97.3	1.3	86.9	87.7	12.4	11.8	13.9	13.1
C5	Skin highlight L* =75	99.5	1.4	72.4	73.7	21.2	20.9	19.5	19.0
D5	Skin shadow L*=28	99.4	1.8	27.1	28.8	16.5	16.0	12.4	12.1
E5	Skin shadow L*=13	100.0	1.5	18.7	20.2	10.8	10.4	9.2	9.2
F5	Maximum Black	100.0	1.1	9.4	10.4	1.1	1.4	-1.9	-1.6
Summary Results		I* Color	I* tone	ΔE					
Average Score for all patches		98.6	94.8	1.7					
Worst 10% (3 lowest scoring patches)		95.1	91.5	3.1					

80 Megalux hours

*HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle
Photo Rag Baryta 315 gsm paper, no additional coating*



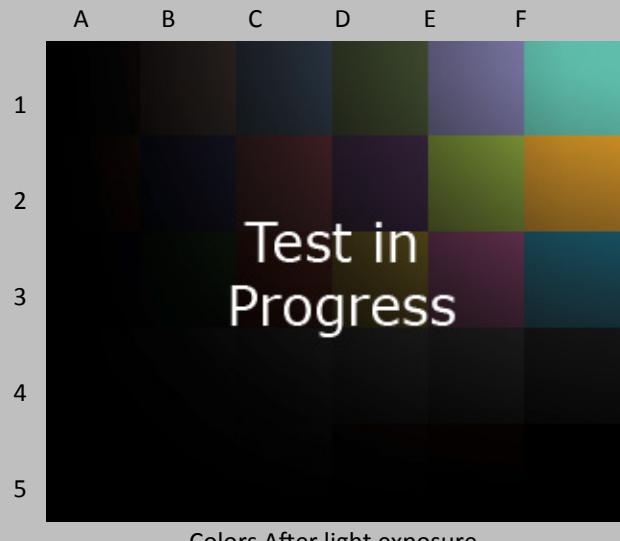
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	99.1	1.7	38.5	40.0	15.4	14.9	14.1	13.6
B1	Light Skin	100.0	1.5	63.4	64.9	18.2	17.8	16.6	16.5
C1	Blue sky	95.4	2.5	51.2	53.2	-4.5	-5.0	-20.5	-19.1
D1	Foliage	100.0	1.5	44.1	45.5	-12.9	-12.7	22.2	22.2
E1	blue flower	92.6	3.2	53.9	56.1	8.3	7.3	-23.3	-21.2
F1	bluish green	98.9	1.3	68.6	69.6	-33.3	-32.4	0.1	0.2
A1	orange	96.6	3.0	61.6	62.3	38.9	38.8	58.6	55.8
B2	purple blue	93.9	3.6	41.7	43.5	6.5	4.6	-42.1	-39.8
C2	moderate red	99.2	1.5	49.2	50.4	45.9	45.2	17.2	17.7
D2	purple	95.0	3.3	31.0	33.5	24.5	23.5	-21.0	-19.2
E2	yellow green	100.0	0.9	70.7	71.5	-23.7	-23.4	59.7	59.6
F2	orange yellow	98.8	1.6	70.5	71.3	22.2	21.8	71.1	69.8
A3	blue	94.6	3.6	32.9	34.7	10.2	7.9	-46.0	-44.0
B3	green	99.2	1.4	55.3	56.3	-38.3	-37.4	30.6	30.5
C3	red	100.0	1.1	41.6	42.7	51.3	51.2	24.7	24.5
D3	yellow	100.0	0.6	79.1	79.7	7.1	6.7	85.9	86.0
E3	magenta	94.8	3.6	51.3	53.2	46.0	44.3	-13.2	-10.8
F3	cyan	98.4	1.9	52.9	54.5	-22.1	-22.3	-25.2	-24.2
A4	white	100.0	0.3	94.1	94.4	-0.1	-0.1	1.8	1.6
B4	neutral 8	100.0	0.7	78.4	79.2	0.0	-0.1	0.7	0.7
C4	neutral 6.5	100.0	0.8	66.4	67.0	0.1	-0.4	0.1	0.0
D4	neutral 5	99.5	1.3	52.1	53.3	0.7	0.2	0.2	0.1
E4	neutral 3.5	100.0	2.1	40.2	42.2	0.2	-0.2	-0.9	-0.7
F4	black	98.2	2.4	24.4	26.7	0.2	0.1	-0.9	-0.2
A5	paper white	100.0	0.3	96.7	96.8	0.1	0.1	1.3	1.1
B5	Skin highlight L*=88	98.0	1.1	86.9	87.6	12.4	11.8	13.9	13.3
C5	Skin highlight L*=75	100.0	1.4	72.4	73.8	21.2	20.9	19.5	19.1
D5	Skin shadow L*=28	99.3	1.9	27.1	29.0	16.5	16.0	12.4	12.0
E5	Skin shadow L*=13	100.0	1.5	18.7	20.2	10.8	10.4	9.2	9.3
F5	Maximum Black	98.9	1.7	9.4	10.9	1.1	1.3	-1.9	-1.3
Summary Results		I* Color	I* tone	ΔE					
Average Score for all patches		98.4	94.5	1.8					
Worst 10% (3 lowest scoring patches)		93.7	91.5	3.6	90 Megalux hours				

$HP\ Designjet\ Z3100ps\ 44"$, $HP\ OEM\ 12\text{-ink}\ Vivera\ Pigment$ for $Z3100$ series printers, $Hahnemühle$ $Photo\ Rag\ Baryta\ 315\ gsm$ paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1							1						
2							2						
3							3						
4							4						
5							5						
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	L*	a*	b*	L*	a*	b*	L*	a*	b*	
A1	Dark Skin	98.7	1.9	38.5	40.3	15.4	14.8	14.1	13.5	38.5	40.3	15.4	
B1	Light Skin	100.0	1.8	63.4	65.1	18.2	17.8	16.6	16.3	63.4	65.1	18.2	
C1	Blue sky	95.0	2.8	51.2	53.6	-4.5	-4.9	-20.5	-19.0	51.2	53.6	-4.5	
D1	Foliage	100.0	1.7	44.1	45.7	-12.9	-12.6	22.2	22.2	44.1	45.7	-12.9	
E1	blue flower	92.6	3.4	53.9	56.4	8.3	7.4	-23.3	-21.1	53.9	56.4	8.3	
F1	bluish green	98.8	1.5	68.6	69.8	-33.3	-32.4	0.1	0.1	68.6	69.8	-33.3	
A1	orange	96.1	3.4	61.6	62.4	38.9	38.9	58.6	55.4	61.6	62.4	38.9	
B2	purple blue	93.9	3.7	41.7	43.8	6.5	4.6	-42.1	-39.8	41.7	43.8	6.5	
C2	moderate red	99.4	1.6	49.2	50.6	45.9	45.2	17.2	17.4	49.2	50.6	45.9	
D2	purple	95.1	3.5	31.0	33.8	24.5	23.4	-21.0	-19.2	31.0	33.8	24.5	
E2	yellow green	100.0	1.1	70.7	71.7	-23.7	-23.4	59.7	59.6	70.7	71.7	-23.7	
F2	orange yellow	98.7	1.7	70.5	71.4	22.2	21.8	71.1	69.7	70.5	71.4	22.2	
A3	blue	94.2	3.9	32.9	35.0	10.2	7.8	-46.0	-43.8	32.9	35.0	10.2	
B3	green	99.2	1.6	55.3	56.6	-38.3	-37.4	30.6	30.6	55.3	56.6	-38.3	
C3	red	100.0	1.3	41.6	42.8	51.3	51.2	24.7	24.3	41.6	42.8	51.3	
D3	yellow	100.0	0.8	79.1	79.8	7.1	6.7	85.9	86.0	79.1	79.8	7.1	
E3	magenta	94.8	3.7	51.3	53.5	46.0	44.2	-13.2	-10.9	51.3	53.5	46.0	
F3	cyan	98.6	2.1	52.9	54.7	-22.1	-22.2	-25.2	-24.3	52.9	54.7	-22.1	
A4	white	100.0	0.6	94.1	94.6	-0.1	0.0	1.8	1.4	94.1	94.6	-0.1	
B4	neutral 8	100.0	0.9	78.4	79.3	0.0	-0.1	0.7	0.5	78.4	79.3	0.0	
C4	neutral 6.5	100.0	1.0	66.4	67.2	0.1	-0.4	0.1	-0.1	66.4	67.2	0.1	
D4	neutral 5	99.3	1.6	52.1	53.6	0.7	0.1	0.2	0.1	52.1	53.6	0.7	
E4	neutral 3.5	100.0	2.4	40.2	42.5	0.2	-0.2	-0.9	-0.7	40.2	42.5	0.2	
F4	black	96.7	2.7	24.4	27.0	0.2	0.2	-0.9	-0.1	24.4	27.0	0.2	
A5	paper white	100.0	0.5	96.7	97.0	0.1	0.1	1.3	0.9	96.7	97.0	0.1	
B5	Skin highlight L*=88	96.3	1.5	86.9	87.8	12.4	11.8	13.9	12.9	86.9	87.8	12.4	
C5	Skin highlight L*=75	99.3	1.7	72.4	73.9	21.2	21.0	19.5	18.8	72.4	73.9	21.2	
D5	Skin shadow L*=28	99.1	2.2	27.1	29.2	16.5	15.9	12.4	12.0	27.1	29.2	16.5	
E5	Skin shadow L*=13	100.0	1.7	18.7	20.3	10.8	10.4	9.2	9.3	18.7	20.3	10.8	
F5	Maximum Black	95.9	2.1	9.4	11.3	1.1	1.4	-1.9	-1.0	9.4	11.3	1.1	
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		98.1	93.9	2.0									
Worst 10% (3 lowest scoring patches)		93.6	90.6	3.8	100 Megalux hours								

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]	1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]
2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]	2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]
3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]	3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]
4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]	4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]
5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]	5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	Before	After	a*	Before	After	a*	Before	After	b*	
A1	Dark Skin	98.0	2.2	38.5	40.5	15.4	14.7	14.1	13.4				
B1	Light Skin	99.3	2.1	63.4	65.4	18.2	17.7	16.6	16.1				
C1	Blue sky	94.8	3.0	51.2	53.8	-4.5	-4.9	-20.5	-18.9				
D1	Foliage	100.0	1.9	44.1	45.9	-12.9	-12.6	22.2	22.0				
E1	blue flower	92.1	3.7	53.9	56.7	8.3	7.4	-23.3	-21.0				
F1	bluish green	98.5	1.7	68.6	69.9	-33.3	-32.3	0.1	0.0				
A1	orange	95.2	4.0	61.6	62.6	38.9	38.8	58.6	54.8				
B2	purple blue	93.7	3.9	41.7	44.0	6.5	4.5	-42.1	-39.6				
C2	moderate red	99.3	1.9	49.2	50.9	45.9	45.1	17.2	17.4				
D2	purple	95.0	3.7	31.0	34.1	24.5	23.6	-21.0	-19.1				
E2	yellow green	100.0	1.3	70.7	71.9	-23.7	-23.4	59.7	59.4				
F2	orange yellow	98.0	2.2	70.5	71.6	22.2	21.6	71.1	69.2				
A3	blue	94.4	3.9	32.9	35.1	10.2	7.9	-46.0	-43.9				
B3	green	98.6	1.9	55.3	56.7	-38.3	-37.2	30.6	30.2				
C3	red	99.9	1.6	41.6	43.1	51.3	51.1	24.7	24.2				
D3	yellow	99.9	1.0	79.1	80.0	7.1	6.5	85.9	85.8				
E3	magenta	94.6	3.9	51.3	53.8	46.0	44.3	-13.2	-10.7				
F3	cyan	98.6	2.3	52.9	54.9	-22.1	-22.1	-25.2	-24.3				
A4	white	100.0	0.7	94.1	94.7	-0.1	-0.1	1.8	1.3				
B4	neutral 8	100.0	1.1	78.4	79.5	0.0	-0.1	0.7	0.5				
C4	neutral 6.5	99.6	1.2	66.4	67.4	0.1	-0.4	0.1	-0.2				
D4	neutral 5	99.1	1.8	52.1	53.8	0.7	0.1	0.2	0.1				
E4	neutral 3.5	100.0	2.7	40.2	42.8	0.2	-0.2	-0.9	-0.7				
F4	black	96.4	2.8	24.4	27.1	0.2	0.2	-0.9	0.0				
A5	paper white	99.1	0.7	96.7	97.0	0.1	0.1	1.3	0.8				
B5	Skin highlight L*=88	94.6	1.9	86.9	88.0	12.4	11.7	13.9	12.6				
C5	Skin highlight L*=75	98.1	2.1	72.4	74.3	21.2	20.9	19.5	18.5				
D5	Skin shadow L*=28	98.8	2.5	27.1	29.5	16.5	15.9	12.4	11.9				
E5	Skin shadow L*=13	100.0	1.9	18.7	20.6	10.8	10.4	9.2	9.2				
F5	Maximum Black	96.5	2.1	9.4	11.3	1.1	1.4	-1.9	-1.1				
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		97.7	93.5	2.3									
Worst 10% (3 lowest scoring patches)		93.4	90.1	4.0	120 Megalux hours								

HP Designjet Z3100ps 44", HP OEM 12-ink Vivera Pigment for Z3100 series printers, Hahnemühle Photo Rag Baryta 315 gsm paper, no additional coating													
	A	B	C	D	E	F		A	B	C	D	E	F
1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]	1	[Color Patch A1]	[Color Patch B1]	[Color Patch C1]	[Color Patch D1]	[Color Patch E1]	[Color Patch F1]
2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]	2	[Color Patch A2]	[Color Patch B2]	[Color Patch C2]	[Color Patch D2]	[Color Patch E2]	[Color Patch F2]
3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]	3	[Color Patch A3]	[Color Patch B3]	[Color Patch C3]	[Color Patch D3]	[Color Patch E3]	[Color Patch F3]
4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]	4	[Color Patch A4]	[Color Patch B4]	[Color Patch C4]	[Color Patch D4]	[Color Patch E4]	[Color Patch F4]
5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]	5	[Color Patch A5]	[Color Patch B5]	[Color Patch C5]	[Color Patch D5]	[Color Patch E5]	[Color Patch F5]
Original Print Colors before light exposure						Colors After light exposure							
Patch #	Description	I* Color	ΔE	Before	After	a*	Before	After	a*	Before	After	b*	
A1	Dark Skin	97.8	2.6	38.5	40.9	15.4	14.7	14.1	13.4				
B1	Light Skin	100.0	2.3	63.4	65.7	18.2	17.7	16.6	16.5				
C1	Blue sky	90.9	3.6	51.2	54.0	-4.5	-4.9	-20.5	-18.1				
D1	Foliage	100.0	2.1	44.1	46.1	-12.9	-12.5	22.2	21.9				
E1	blue flower	88.1	4.6	53.9	56.9	8.3	7.3	-23.3	-20.0				
F1	bluish green	97.8	1.8	68.6	69.9	-33.3	-32.1	0.1	0.5				
A1	orange	94.0	4.8	61.6	62.7	38.9	38.8	58.6	53.9				
B2	purple blue	91.1	5.0	41.7	44.2	6.5	4.2	-42.1	-38.5				
C2	moderate red	98.6	2.3	49.2	51.2	45.9	44.9	17.2	17.8				
D2	purple	92.7	4.4	31.0	34.4	24.5	23.5	-21.0	-18.4				
E2	yellow green	99.4	1.5	70.7	71.9	-23.7	-23.2	59.7	59.0				
F2	orange yellow	97.0	3.0	70.5	71.6	22.2	21.6	71.1	68.4				
A3	blue	92.4	4.7	32.9	35.3	10.2	7.4	-46.0	-43.0				
B3	green	98.2	2.0	55.3	56.7	-38.3	-37.0	30.6	30.2				
C3	red	100.0	1.8	41.6	43.4	51.3	51.1	24.7	24.3				
D3	yellow	99.8	1.0	79.1	79.9	7.1	6.6	85.9	85.5				
E3	magenta	92.5	4.8	51.3	53.9	46.0	44.1	-13.2	-9.7				
F3	cyan	96.2	2.7	52.9	55.0	-22.1	-22.0	-25.2	-23.5				
A4	white	100.0	0.4	94.1	94.4	-0.1	-0.1	1.8	2.1				
B4	neutral 8	99.9	1.1	78.4	79.4	0.0	-0.1	0.7	1.2				
C4	neutral 6.5	99.5	1.1	66.4	67.3	0.1	-0.4	0.1	0.4				
D4	neutral 5	98.5	1.8	52.1	53.8	0.7	0.1	0.2	0.5				
E4	neutral 3.5	96.2	3.1	40.2	43.2	0.2	-0.2	-0.9	-0.2				
F4	black	94.0	3.1	24.4	27.4	0.2	0.2	-0.9	0.2				
A5	paper white	100.0	0.3	96.7	96.8	0.1	0.0	1.3	1.6				
B5	Skin highlight L*=88	96.5	1.5	86.9	87.9	12.4	11.7	13.9	13.0				
C5	Skin highlight L*=75	99.1	2.1	72.4	74.3	21.2	20.8	19.5	18.9				
D5	Skin shadow L*=28	98.5	2.9	27.1	29.9	16.5	15.9	12.4	11.9				
E5	Skin shadow L*=13	100.0	2.3	18.7	21.0	10.8	10.4	9.2	9.3				
F5	Maximum Black	93.9	2.9	9.4	12.1	1.1	1.4	-1.9	-0.9				
Summary Results		I* Color	I* tone	ΔE									
Average Score for all patches		96.8	92.8	2.6									
Worst 10% (3 lowest scoring patches)		90.0	89.4	4.9	140 Megalux hours								

The 200 Megalux hour Update will be posted on approximately JULY 15, 2016.



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin			38.5	15.4	14.1			
B1	Light Skin			63.4	18.2	16.6			
C1	Blue sky			51.2	-4.5	-20.5			
D1	Foliage			44.1	-12.9	22.2			
E1	blue flower			53.9	8.3	-23.3			
F1	bluish green			68.6	-33.3	0.1			
A1	orange			61.6	38.9	58.6			
B2	purple blue			41.7	6.5	-42.1			
C2	moderate red			49.2	45.9	17.2			
D2	purple			31.0	24.5	-21.0			
E2	yellow green			70.7	-23.7	59.7			
F2	orange yellow			70.5	22.2	71.1			
A3	blue			32.9	10.2	-46.0			
B3	green			55.3	-38.3	30.6			
C3	red			41.6	51.3	24.7			
D3	yellow			79.1	7.1	85.9			
E3	magenta			51.3	46.0	-13.2			
F3	cyan			52.9	-22.1	-25.2			
A4	white			94.1	-0.1	1.8			
B4	neutral 8			78.4	0.0	0.7			
C4	neutral 6.5			66.4	0.1	0.1			
D4	neutral 5			52.1	0.7	0.2			
E4	neutral 3.5			40.2	0.2	-0.9			
F4	black			24.4	0.2	-0.9			
A5	paper white			96.7	0.1	1.3			
B5	Skin highlight L*=88			86.9	12.4	13.9			
C5	Skin highlight L*=75			72.4	21.2	19.5			
D5	Skin shadow L*=28			27.1	16.5	12.4			
E5	Skin shadow L*=13			18.7	10.8	9.2			
F5	Maximum Black			9.4	1.1	-1.9			
Summary Results		I* Color	I* tone	ΔE					
Average Score for all patches									
Worst 10% (3 lowest scoring patches)									
200 Megalux hours									