

Aardenburg

144



IMAGING & ARCHIVES

Tested System:

ID#:277

Printer: Epson Stylus Photo R3000

Inks/Colorants: ConeColorPro® ink (for Epson R3000 printer)

Media: Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil)

Coating(s): no additional coating

Sample #: AaI_20121130_SN002

Testing Status: 160 Megalux hours total light exposure

Testing Is ongoing, next update on approximately DEC 20, 2017

Conservation Display Rating (CDR)

Lower limit: 8.4 Megalux hours (for weakest 10% of the color patches)

Upper limit: 14 Megalux hours (for average of all the color patches)

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.

This report has been prepared for the exclusive use of members of Aardenburg Imaging & Archives. Members may share this information with other members, friends, colleagues, and individual clients. It may also be distributed to groups for educational purposes (classes, lectures, educational seminars. etc). However, all contents including but not limited to Conservation Display Ratings may not be posted to web sites and may not be reproduced or distributed for corporate research, marketing, or other promotional purposes without written permission from Aardenburg Imaging & Archives.

copyright ©2017

<http://www.aardenburg-imaging.com>

Aardenburg Imaging and Archives
Rev:8/17/17



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 “Kodak Display Years” (1)	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

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!

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.

(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).

(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.

Sample Description

Sample # AaI_20121130_SN002 **Batch #:** M1
Printer: Epson Stylus Photo R3000
Ink: ConeColorPro® ink (for Epson R3000 printer)
Media: Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil)
Coating(s): no additional coating

Test Print Prepared by: AaI&A member
Printed: November 30, 2012
Initial Print colors measured February 17, 2013
Test Started: February 20, 2013

Test Image: AaI_StandardColorSet(v2)forSRGB.tif
RIP?Driver settings: PSCS5, Epson OEM driver, max quality, color = NCA (no color adjustment)

Media Setting Epson Premium Photo Paper Glossy

Profile: RR_UPS_Cone2_8-11-12.icc **Rendering** n.a.
Profile type: custom

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

Optical Brighteners Present? <i>yes (low)</i>	L*		a*		b*	
Media Whitepoint Color	UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
	94.5	94.6	0.2	-0.3	-3.5	-1.7
	UV-inc/UV-exc ΔL^*, Δa^*, Δb^* respectively					
	0.1		0.5		1.8	
	<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)		
	10.4	0.4	-2.0	1.93		

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: 10797 Lux
Average Temperature: 24.5°C over full test duration, 25.7°C during light exposure.
Average Relative humidity: 55.8%RH over full test duration, 56.0%RH during light exposure.

Notes/Comments:**Replicates/Compare to:**

Compare to these other Red River Ultra Pro Satin 2.0 paper samples tested as part of a direct side-by-side light fade test for this paper:

ID# 273 – sample # AaI_20121030_SN001 – printed on an Epson 1400 printer using the Epson OEM Claria 79 dyebase ink set.

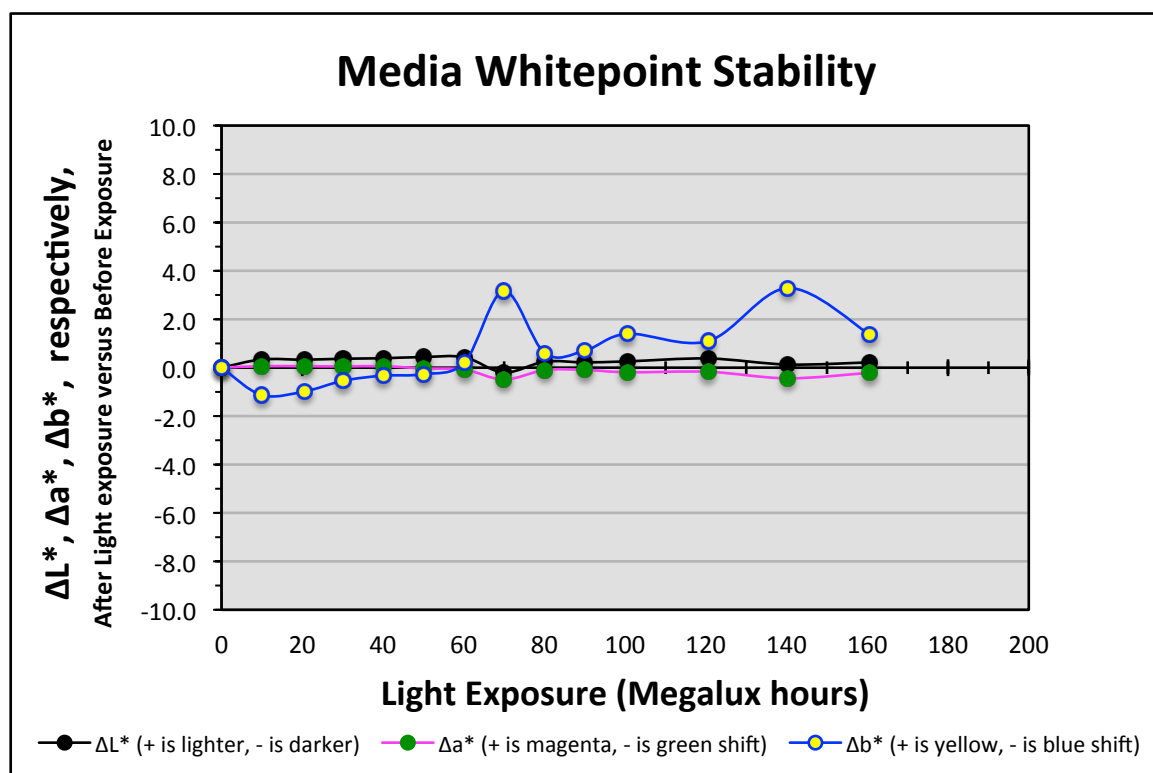
ID# 275 – sample # AaI_20121030_SN003 – printed on the same Epson 1400 printer and paper batch used to print sample # AaI_20121030_SN001 but using the MIS Associates D2 “Claria compatible” dyebase ink set.

ID# 276 – sample # AaI_20121116_SN001 – printed on an Epson Stylus Pro 7880 using Epson OEM UltraChrome K3™ with Vivid Magenta pigmented ink set.

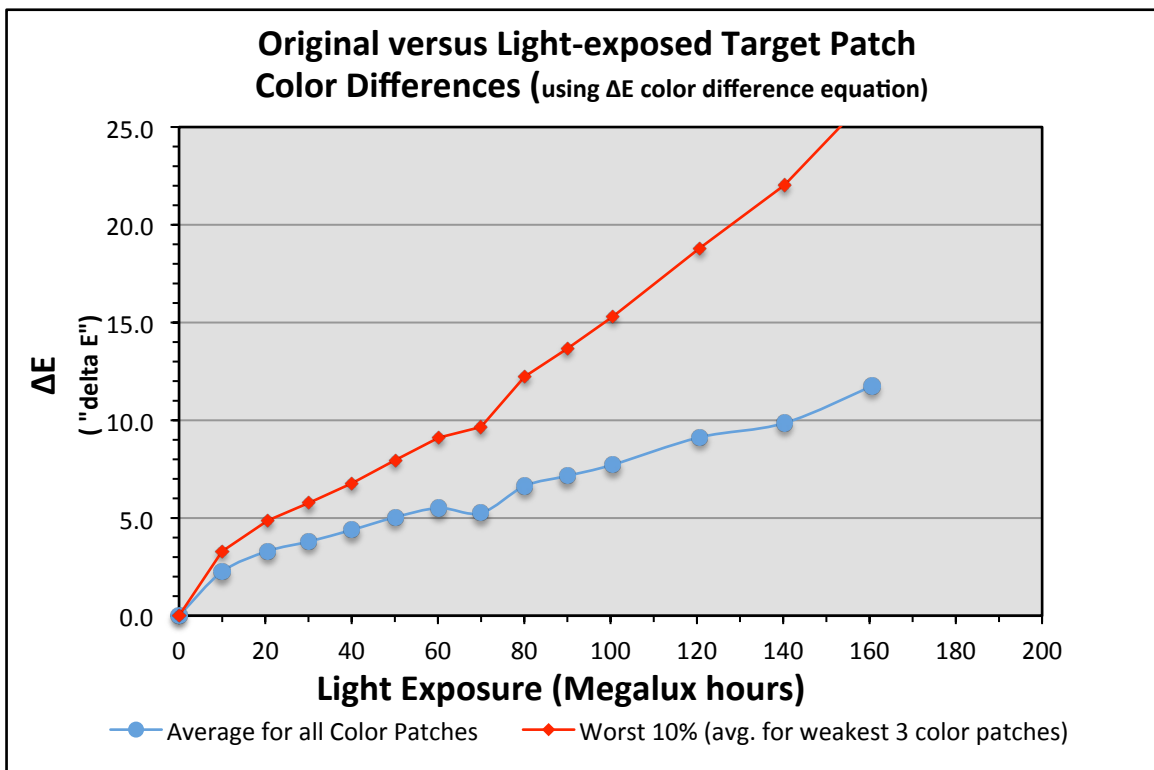
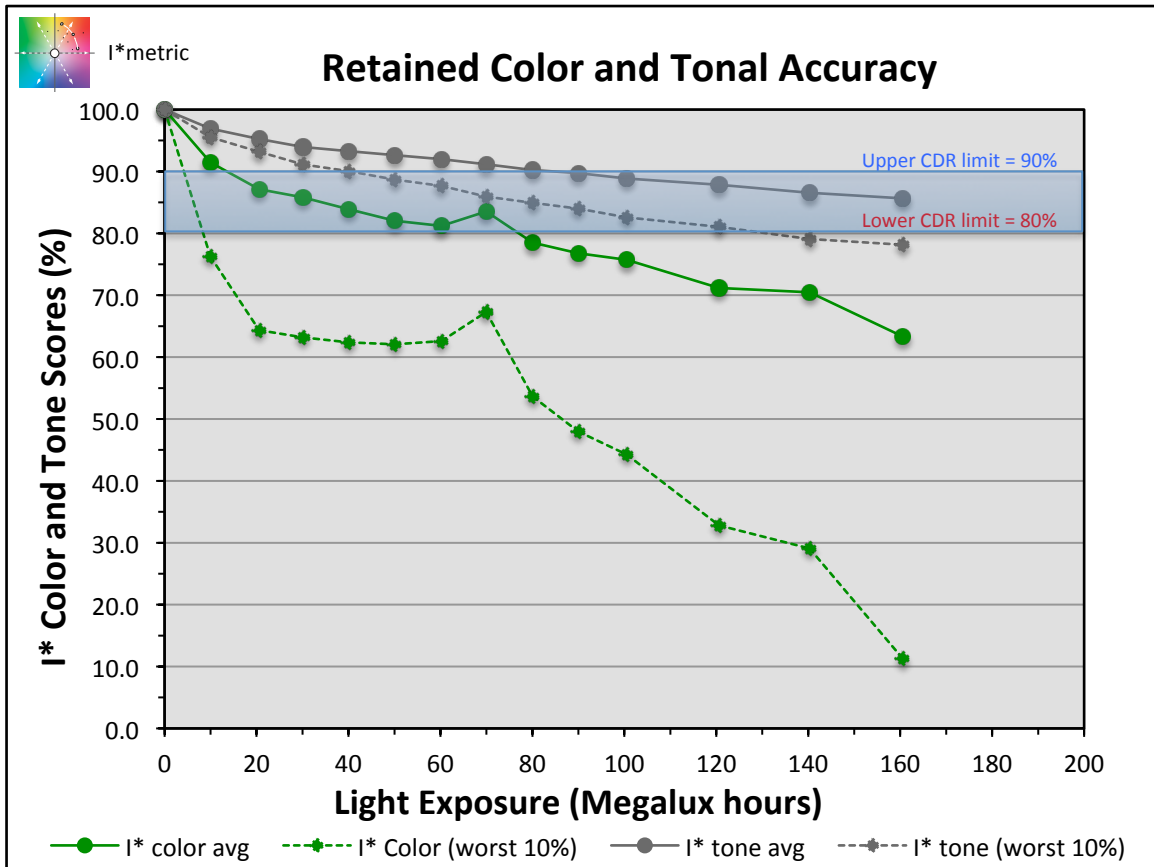
MHMG 2015-06-07: The significant jump in b* value on the whitepoint stability graphs at 70 Mluxhrs and partial recovery at 80 Mluxhrs were not measurement errors. The 70 Mluxhr measurements was delayed approximately six weeks after removing the sample from the light fade unit. The temporary "dark storage" period caused a phenomenon I call "light-induced low intensity staining (LILIS). LILIS is additional media yellowing over and above the yellowing caused by loss of fluorescence as the optical brighteners (OBAs) fade. However, it may well be discoloration directly associated with the faded OBA degradation by-products. The widely held assertion that papers simply return to their "natural" color as the OBAs fade is now called into question with the LILIS effect. This additional yellow stain formation can also be partially or fully reversed with more light exposure of sufficient intensity as evidenced by the 80 Mluxhr exposure results which were measured immediately after removal of the sample from the light fade test unit. Unfortunately, the stain will return again with further storage in low intensity or dark storage environments.

Graphs:

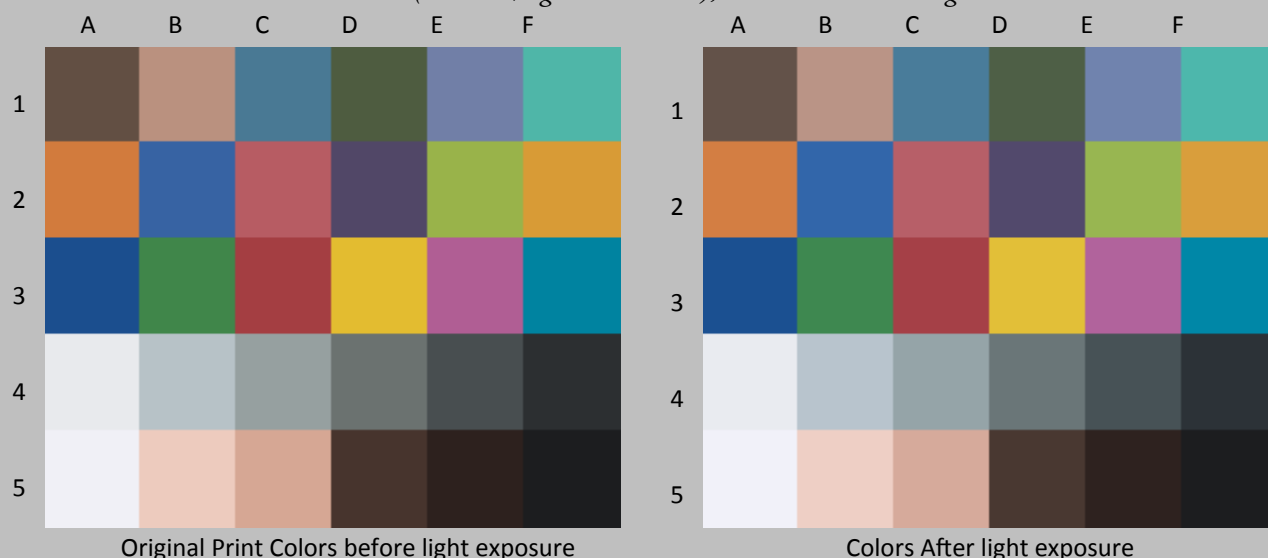
Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating

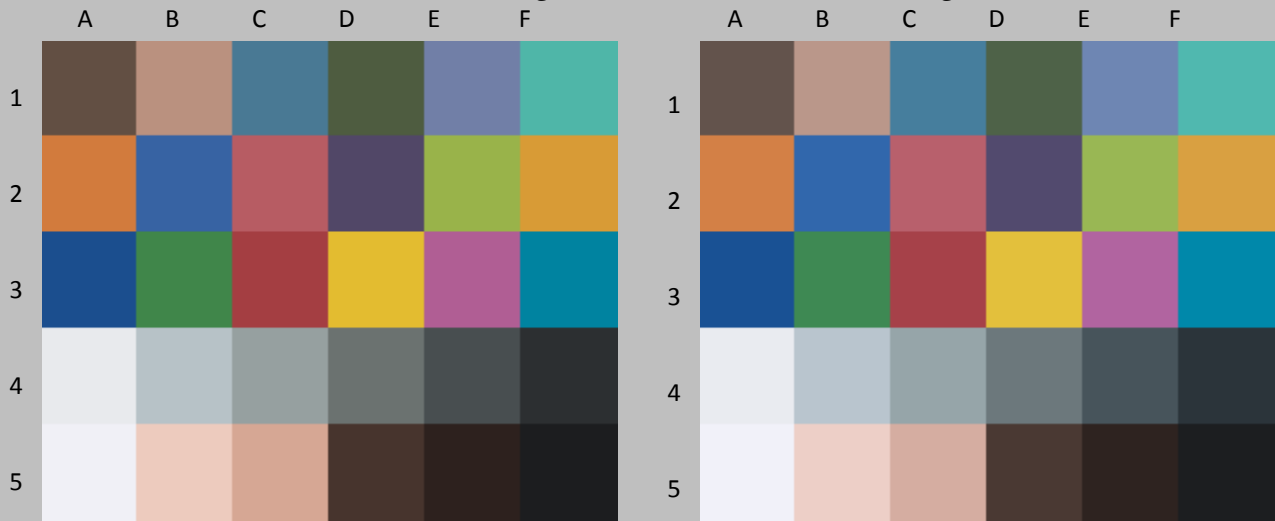


Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	86.8	2.4	35.2	36.4	7.0	6.0	10.2	8.3
B1	Light Skin	89.4	3.0	63.8	64.9	14.4	13.1	15.8	13.3
C1	Blue sky	90.9	2.8	48.2	49.3	-10.7	-11.5	-19.8	-22.2
D1	Foliage	89.7	2.6	37.3	38.5	-9.8	-11.2	14.3	12.4
E1	blue flower	90.8	2.9	53.4	54.5	1.9	0.9	-22.9	-25.4
F1	bluish green	95.9	2.0	67.7	68.4	-33.6	-33.6	-2.4	-4.3
A1	orange	97.5	2.1	60.6	61.4	30.9	29.8	48.0	46.4
B2	purplish blue	95.5	2.6	41.2	42.3	1.0	0.3	-40.2	-42.4
C2	moderate red	95.8	2.3	50.5	51.3	38.1	37.4	13.7	11.6
D2	purple	93.6	1.9	32.3	33.1	10.4	10.1	-16.9	-18.6
E2	yellow green	97.9	1.8	69.3	70.1	-21.2	-21.8	48.8	47.3
F2	orange yellow	97.7	2.1	68.8	69.7	16.9	15.6	58.9	57.5
A3	blue	96.7	2.1	32.4	33.4	2.1	2.0	-40.6	-42.5
B3	green	97.0	2.0	50.1	51.0	-33.0	-34.0	24.6	23.2
C3	red	98.2	1.5	41.3	41.9	43.2	43.1	20.7	19.4
D3	yellow	97.9	2.2	78.1	79.0	4.6	3.4	69.9	68.4
E3	magenta	94.2	3.1	51.4	52.4	39.1	38.2	-14.4	-17.1
F3	cyan	95.4	2.3	49.9	51.0	-24.4	-24.8	-25.1	-27.1
A4	white	91.9	1.4	92.4	92.9	0.3	0.2	-1.6	-2.9
B4	neutral 8	82.9	2.3	77.5	78.4	-2.6	-3.1	-4.1	-6.2
C4	neutral 6.5	80.4	2.6	65.0	66.1	-3.8	-4.6	-1.4	-3.6
D4	neutral 5	77.8	2.9	47.4	48.7	-3.1	-4.0	-0.4	-2.8
E4	neutral 3.5	72.5	3.4	32.5	34.0	-2.5	-3.6	-1.6	-4.5
F4	black	78.5	2.8	19.2	20.4	-1.4	-2.5	-1.8	-4.1
A5	paper white	93.4	1.2	95.0	95.3	0.5	0.6	-3.1	-4.2
B5	Skin highlight L*=88	85.8	2.9	84.5	85.3	10.8	10.1	11.2	8.6
C5	Skin highlight L* =75	88.4	3.4	72.4	73.5	16.2	14.8	16.7	13.8
D5	Skin shadow L*=28	91.9	1.8	24.0	25.0	8.3	7.4	8.4	7.2
E5	Skin shadow L*=13	100.0	0.7	14.0	14.5	6.0	5.7	3.6	3.9
F5	Maximum Black	100.0	0.5	10.4	10.7	0.4	0.0	-2.0	-2.3
Summary Results		I* Color	I* tone	ΔE	10 Megalux hours				
Average Score for all patches		91.5	96.9	2.2					
Worst 10% (3 lowest scoring patches)		76.3	95.5	3.3					

*Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin
2.0 (68lb - 270gsm - 10.4 mil), no additional coating*

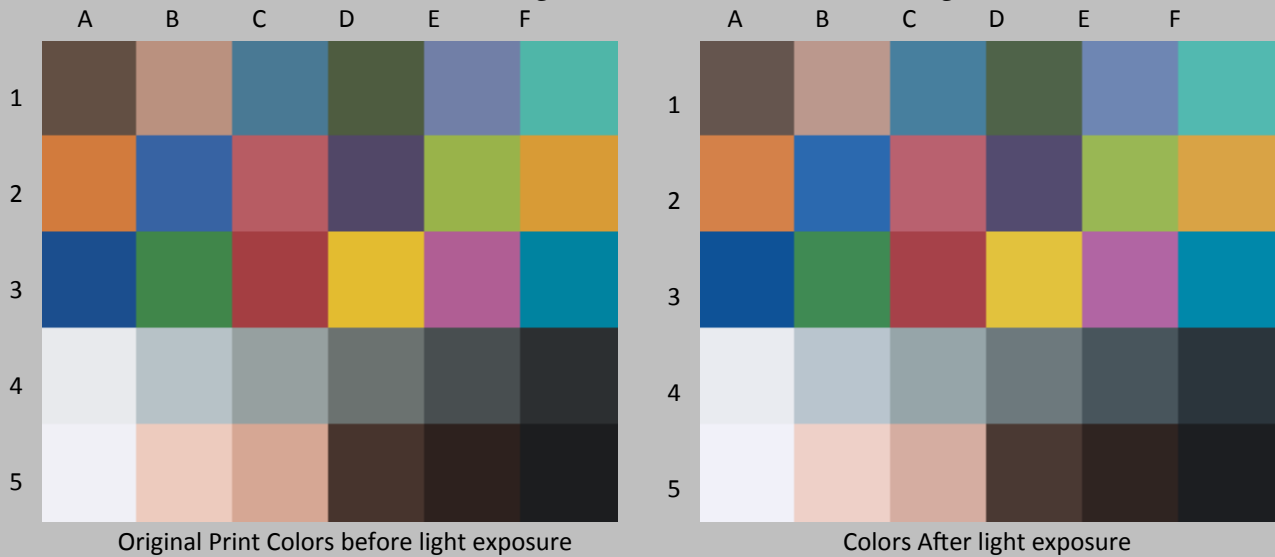


Original Print Colors before light exposure

Colors After light exposure

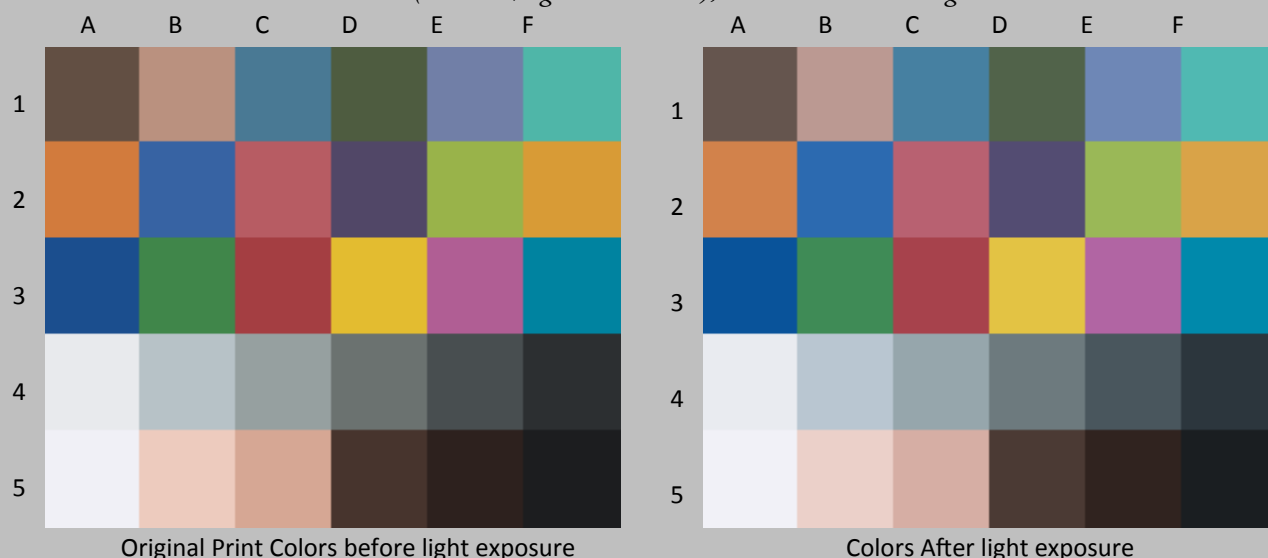
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	79.3	3.5	35.2	37.0	7.0	5.7	10.2	7.4
B1	Light Skin	81.5	4.7	63.8	65.4	14.4	12.5	15.8	11.7
C1	Blue sky	86.6	3.9	48.2	49.9	-10.7	-11.8	-19.8	-23.1
D1	Foliage	84.6	3.7	37.3	39.2	-9.8	-11.6	14.3	11.7
E1	blue flower	85.3	4.3	53.4	55.1	1.9	0.3	-22.9	-26.5
F1	bluish green	94.1	2.6	67.7	68.7	-33.6	-33.5	-2.4	-4.9
A1	orange	94.5	3.9	60.6	61.9	30.9	29.0	48.0	44.9
B2	purplish blue	92.5	3.9	41.2	42.9	1.0	-0.3	-40.2	-43.5
C2	moderate red	91.9	4.0	50.5	51.7	38.1	36.9	13.7	10.1
D2	purple	88.4	3.0	32.3	33.5	10.4	9.9	-16.9	-19.6
E2	yellow green	95.9	2.9	69.3	70.5	-21.2	-21.9	48.8	46.2
F2	orange yellow	95.1	3.7	68.8	70.2	16.9	14.7	58.9	56.2
A3	blue	94.2	3.2	32.4	33.9	2.1	1.5	-40.6	-43.4
B3	green	95.0	2.9	50.1	51.5	-33.0	-34.3	24.6	22.4
C3	red	96.2	2.5	41.3	42.3	43.2	43.0	20.7	18.4
D3	yellow	96.2	3.4	78.1	79.3	4.6	2.7	69.9	67.4
E3	magenta	90.3	4.8	51.4	52.9	39.1	37.6	-14.4	-18.7
F3	cyan	93.3	3.2	49.9	51.4	-24.4	-25.0	-25.1	-27.8
A4	white	92.5	1.3	92.4	92.9	0.3	0.2	-1.6	-2.8
B4	neutral 8	80.1	2.7	77.5	78.7	-2.6	-3.1	-4.1	-6.5
C4	neutral 6.5	74.1	3.3	65.0	66.6	-3.8	-4.8	-1.4	-4.1
D4	neutral 5	69.2	3.9	47.4	49.3	-3.1	-4.3	-0.4	-3.6
E4	neutral 3.5	60.2	4.8	32.5	34.8	-2.5	-3.9	-1.6	-5.6
F4	black	63.6	4.5	19.2	21.2	-1.4	-3.0	-1.8	-5.4
A5	paper white	94.9	1.0	95.0	95.3	0.5	0.6	-3.1	-4.1
B5	Skin highlight L*=88	81.9	3.5	84.5	85.6	10.8	9.6	11.2	8.1
C5	Skin highlight L* =75	81.8	5.0	72.4	74.0	16.2	14.2	16.7	12.4
D5	Skin shadow L*=28	85.4	2.8	24.0	25.7	8.3	7.1	8.4	6.5
E5	Skin shadow L*=13	98.2	1.2	14.0	14.9	6.0	5.4	3.6	4.0
F5	Maximum Black	97.1	1.0	10.4	11.0	0.4	-0.3	-2.0	-2.5
Summary Results		I* Color	I* tone	ΔE	20 Megalux hours				
Average Score for all patches		87.1	95.2	3.3					
Worst 10% (3 lowest scoring patches)		64.3	93.2	4.9					

*Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin
2.0 (68lb - 270gsm - 10.4 mil), no additional coating*



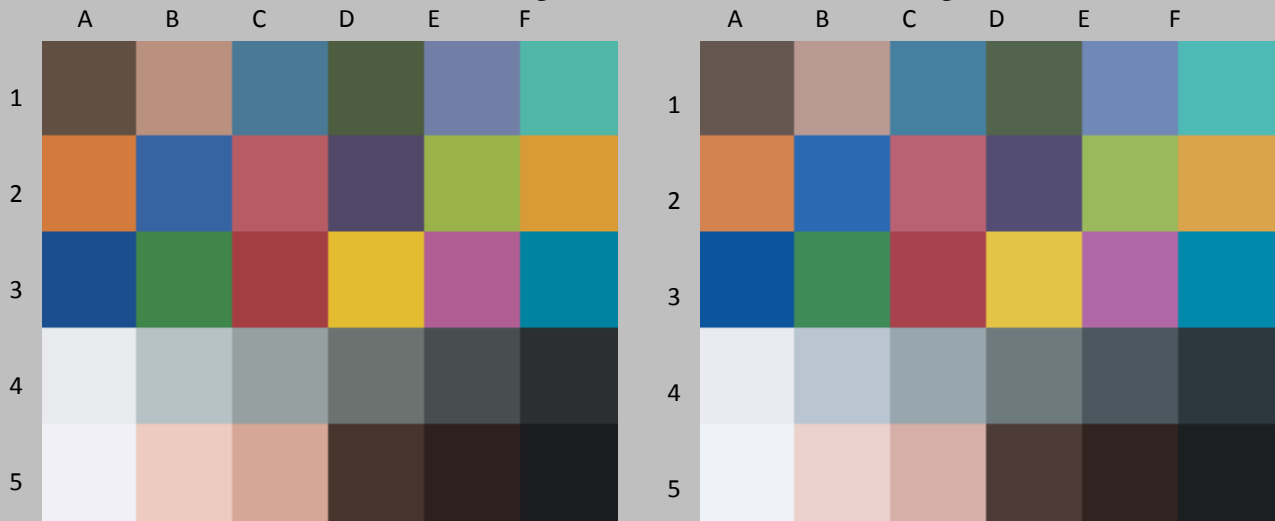
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	77.7	4.0	35.2	37.5	7.0	5.6	10.2	7.2
B1	Light Skin	76.3	5.9	63.8	65.9	14.4	12.3	15.8	10.6
C1	Blue sky	84.9	4.4	48.2	50.2	-10.7	-12.1	-19.8	-23.4
D1	Foliage	84.4	4.0	37.3	39.8	-9.8	-11.6	14.3	11.6
E1	blue flower	83.0	4.9	53.4	55.5	1.9	0.2	-22.9	-27.0
F1	bluish green	92.5	3.2	67.7	68.9	-33.6	-33.3	-2.4	-5.4
A1	orange	93.1	4.7	60.6	62.2	30.9	28.8	48.0	44.1
B2	purplish blue	91.0	4.6	41.2	43.2	1.0	-0.7	-40.2	-44.0
C2	moderate red	89.1	5.1	50.5	52.0	38.1	36.9	13.7	8.9
D2	purple	85.4	3.7	32.3	33.8	10.4	9.7	-16.9	-20.2
E2	yellow green	95.1	3.4	69.3	70.8	-21.2	-22.0	48.8	45.8
F2	orange yellow	93.7	4.8	68.8	70.9	16.9	14.5	58.9	55.3
A3	blue	92.7	3.9	32.4	34.2	2.1	1.2	-40.6	-44.0
B3	green	94.4	3.3	50.1	51.8	-33.0	-34.3	24.6	22.1
C3	red	95.4	2.9	41.3	42.5	43.2	43.1	20.7	18.0
D3	yellow	95.3	4.1	78.1	79.6	4.6	2.4	69.9	66.8
E3	magenta	88.4	5.6	51.4	53.3	39.1	37.6	-14.4	-19.5
F3	cyan	92.5	3.5	49.9	51.5	-24.4	-25.3	-25.1	-28.1
A4	white	93.4	1.3	92.4	93.0	0.3	0.3	-1.6	-2.7
B4	neutral 8	81.0	2.7	77.5	78.9	-2.6	-3.0	-4.1	-6.4
C4	neutral 6.5	71.7	3.7	65.0	66.9	-3.8	-4.8	-1.4	-4.4
D4	neutral 5	68.6	4.2	47.4	49.7	-3.1	-4.3	-0.4	-3.7
E4	neutral 3.5	60.2	5.1	32.5	35.2	-2.5	-3.9	-1.6	-5.6
F4	black	60.7	4.8	19.2	21.5	-1.4	-3.2	-1.8	-5.7
A5	paper white	99.6	0.7	95.0	95.3	0.5	0.6	-3.1	-3.6
B5	Skin highlight L*=88	78.2	4.1	84.5	85.7	10.8	9.6	11.2	7.5
C5	Skin highlight L* =75	78.8	5.8	72.4	74.3	16.2	14.1	16.7	11.7
D5	Skin shadow L*=28	86.1	2.9	24.0	26.0	8.3	7.2	8.4	6.6
E5	Skin shadow L*=13	96.0	1.5	14.0	15.2	6.0	5.4	3.6	4.2
F5	Maximum Black	94.6	1.1	10.4	10.8	0.4	-0.5	-2.0	-2.6
Summary Results		I* Color	I* tone	ΔE	30 Megalux hours				
Average Score for all patches		85.8	93.9	3.8					
Worst 10% (3 lowest scoring patches)		63.2	91.1	5.8					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	75.3	4.4	35.2	37.8	7.0	5.7	10.2	6.9
B1	Light Skin	70.7	7.2	63.8	66.2	14.4	12.3	15.8	9.3
C1	Blue sky	83.5	4.7	48.2	50.4	-10.7	-12.0	-19.8	-23.8
D1	Foliage	85.0	4.2	37.3	40.1	-9.8	-11.5	14.3	11.7
E1	blue flower	81.1	5.4	53.4	55.7	1.9	0.3	-22.9	-27.5
F1	bluish green	90.6	3.9	67.7	69.0	-33.6	-33.1	-2.4	-6.0
A1	orange	90.5	6.2	60.6	62.5	30.9	28.4	48.0	42.7
B2	purplish blue	90.0	5.0	41.2	43.4	1.0	-0.8	-40.2	-44.4
C2	moderate red	86.3	6.3	50.5	52.2	38.1	36.8	13.7	7.8
D2	purple	81.9	4.4	32.3	34.0	10.4	9.7	-16.9	-20.9
E2	yellow green	93.4	4.3	69.3	71.0	-21.2	-22.0	48.8	44.8
F2	orange yellow	91.5	6.1	68.8	71.0	16.9	14.0	58.9	54.0
A3	blue	91.4	4.5	32.4	34.4	2.1	1.2	-40.6	-44.5
B3	green	92.9	3.9	50.1	52.0	-33.0	-34.2	24.6	21.4
C3	red	93.6	3.8	41.3	42.7	43.2	43.1	20.7	17.2
D3	yellow	93.2	5.6	78.1	79.9	4.6	2.0	69.9	65.3
E3	magenta	86.6	6.4	51.4	53.5	39.1	37.5	-14.4	-20.3
F3	cyan	91.9	3.8	49.9	51.7	-24.4	-25.2	-25.1	-28.3
A4	white	92.0	1.4	92.4	93.0	0.3	0.4	-1.6	-2.9
B4	neutral 8	78.6	3.0	77.5	79.1	-2.6	-2.9	-4.1	-6.6
C4	neutral 6.5	68.3	4.1	65.0	67.1	-3.8	-4.7	-1.4	-4.7
D4	neutral 5	66.8	4.5	47.4	50.0	-3.1	-4.2	-0.4	-3.9
E4	neutral 3.5	60.3	5.3	32.5	35.6	-2.5	-3.8	-1.6	-5.6
F4	black	60.1	5.1	19.2	21.9	-1.4	-3.2	-1.8	-5.7
A5	paper white	100.0	0.5	95.0	95.4	0.5	0.6	-3.1	-3.4
B5	Skin highlight L*=88	73.9	4.7	84.5	85.6	10.8	9.5	11.2	6.8
C5	Skin highlight L* =75	74.5	6.8	72.4	74.5	16.2	13.9	16.7	10.7
D5	Skin shadow L*=28	86.8	3.1	24.0	26.3	8.3	7.4	8.4	6.6
E5	Skin shadow L*=13	94.2	1.8	14.0	15.4	6.0	5.5	3.6	4.5
F5	Maximum Black	92.2	1.4	10.4	11.0	0.4	-0.6	-2.0	-2.8
Summary Results		I* Color	I* tone	ΔE	40 Megalux hours				
Average Score for all patches		83.9	93.3	4.4					
Worst 10% (3 lowest scoring patches)		62.4	90.1	6.8					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating

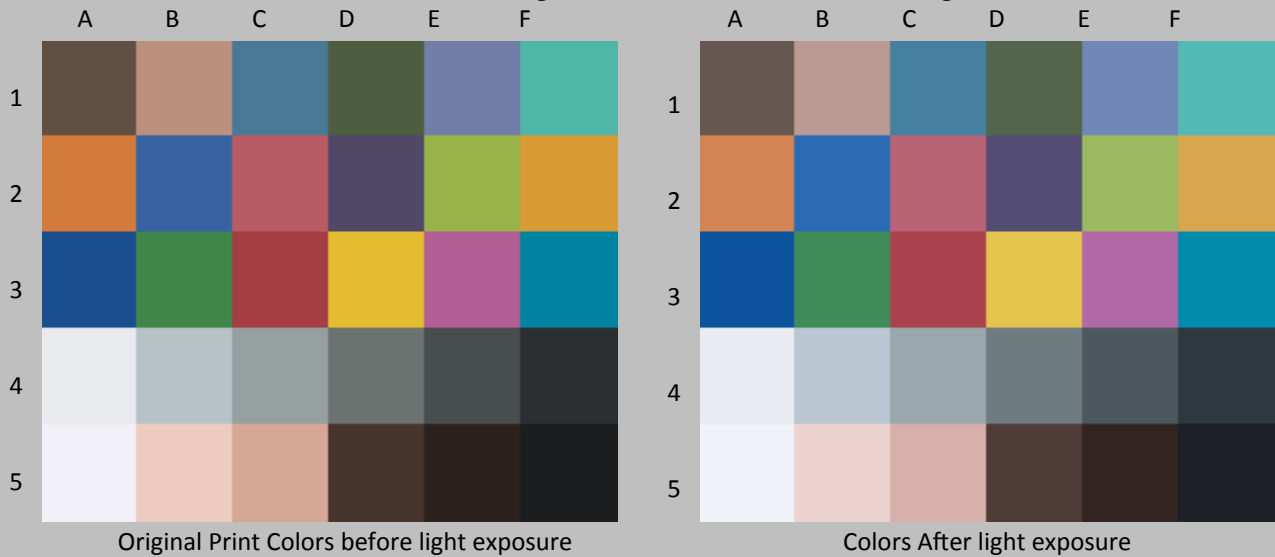


Original Print Colors before light exposure

Colors After light exposure

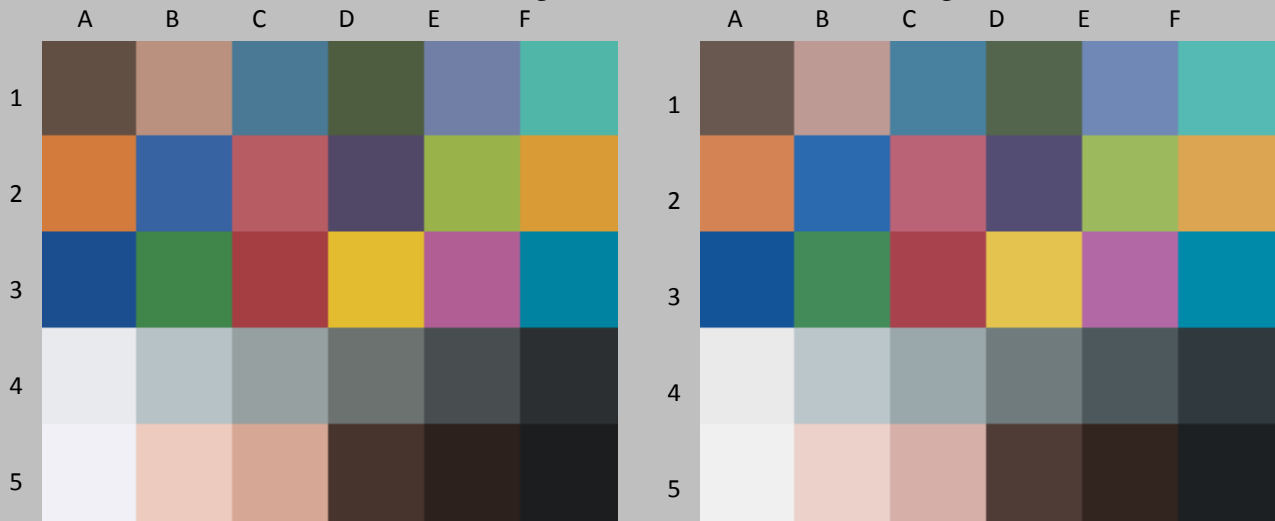
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	72.3	4.9	35.2	38.1	7.0	5.9	10.2	6.4
B1	Light Skin	66.5	8.1	63.8	66.4	14.4	12.4	15.8	8.4
C1	Blue sky	82.7	5.0	48.2	50.6	-10.7	-11.8	-19.8	-24.0
D1	Foliage	84.6	4.5	37.3	40.5	-9.8	-11.3	14.3	11.5
E1	blue flower	79.1	5.9	53.4	56.0	1.9	0.4	-22.9	-28.1
F1	bluish green	88.6	4.6	67.7	69.2	-33.6	-32.7	-2.4	-6.6
A1	orange	87.7	7.9	60.6	62.9	30.9	28.0	48.0	41.1
B2	purplish blue	89.6	5.3	41.2	43.6	1.0	-0.9	-40.2	-44.5
C2	moderate red	83.7	7.3	50.5	52.5	38.1	36.7	13.7	6.7
D2	purple	79.4	5.0	32.3	34.3	10.4	9.8	-16.9	-21.4
E2	yellow green	90.7	5.8	69.3	71.4	-21.2	-21.8	48.8	43.4
F2	orange yellow	88.9	7.7	68.8	71.4	16.9	13.7	58.9	52.4
A3	blue	90.8	4.8	32.4	34.8	2.1	1.3	-40.6	-44.8
B3	green	90.5	4.9	50.1	52.3	-33.0	-34.0	24.6	20.3
C3	red	91.8	4.7	41.3	43.0	43.2	43.0	20.7	16.3
D3	yellow	90.9	7.2	78.1	80.2	4.6	1.8	69.9	63.6
E3	magenta	85.5	6.9	51.4	53.8	39.1	37.2	-14.4	-20.7
F3	cyan	91.5	4.0	49.9	52.0	-24.4	-24.9	-25.1	-28.5
A4	white	90.5	1.6	92.4	93.1	0.3	0.4	-1.6	-3.0
B4	neutral 8	75.6	3.3	77.5	79.2	-2.6	-2.8	-4.1	-6.9
C4	neutral 6.5	65.5	4.5	65.0	67.4	-3.8	-4.5	-1.4	-5.1
D4	neutral 5	65.9	4.8	47.4	50.4	-3.1	-4.1	-0.4	-4.0
E4	neutral 3.5	60.6	5.5	32.5	36.0	-2.5	-3.8	-1.6	-5.6
F4	black	60.2	5.4	19.2	22.5	-1.4	-3.1	-1.8	-5.8
A5	paper white	100.0	0.5	95.0	95.4	0.5	0.5	-3.1	-3.3
B5	Skin highlight L*=88	68.7	5.6	84.5	85.9	10.8	9.5	11.2	6.0
C5	Skin highlight L* =75	69.7	7.9	72.4	74.8	16.2	13.9	16.7	9.5
D5	Skin shadow L*=28	86.4	3.5	24.0	26.8	8.3	7.4	8.4	6.5
E5	Skin shadow L*=13	91.6	2.2	14.0	15.7	6.0	5.7	3.6	4.9
F5	Maximum Black	91.4	1.7	10.4	11.5	0.4	-0.7	-2.0	-2.8
Summary Results		I* Color	I* tone	ΔE	50 Megalux hours				
Average Score for all patches		82.0	92.6	5.0					
Worst 10% (3 lowest scoring patches)		62.1	88.7	8.0					

*Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin
2.0 (68lb - 270gsm - 10.4 mil), no additional coating*



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	71.8	5.1	35.2	38.4	7.0	6.1	10.2	6.3
B1	Light Skin	62.7	8.9	63.8	66.7	14.4	12.5	15.8	7.5
C1	Blue sky	82.3	5.1	48.2	50.7	-10.7	-11.8	-19.8	-24.1
D1	Foliage	85.4	4.7	37.3	40.9	-9.8	-11.1	14.3	11.5
E1	blue flower	79.2	6.0	53.4	56.2	1.9	0.6	-22.9	-28.1
F1	bluish green	87.0	5.2	67.7	69.5	-33.6	-32.5	-2.4	-7.1
A1	orange	85.3	9.3	60.6	63.2	30.9	27.8	48.0	39.7
B2	purplish blue	89.6	5.4	41.2	43.8	1.0	-0.9	-40.2	-44.5
C2	moderate red	81.6	8.3	50.5	52.8	38.1	36.7	13.7	5.8
D2	purple	76.8	5.6	32.3	34.6	10.4	10.0	-16.9	-21.9
E2	yellow green	88.7	6.9	69.3	71.7	-21.2	-21.7	48.8	42.3
F2	orange yellow	86.6	9.1	68.8	71.7	16.9	13.4	58.9	51.0
A3	blue	90.0	5.2	32.4	34.9	2.1	1.3	-40.6	-45.2
B3	green	89.4	5.5	50.1	52.6	-33.0	-33.9	24.6	19.8
C3	red	90.5	5.4	41.3	43.2	43.2	43.1	20.7	15.7
D3	yellow	89.0	8.6	78.1	80.5	4.6	1.6	69.9	62.3
E3	magenta	84.8	7.3	51.4	54.0	39.1	37.3	-14.4	-21.0
F3	cyan	91.6	4.1	49.9	52.2	-24.4	-24.9	-25.1	-28.5
A4	white	92.9	1.4	92.4	93.1	0.3	0.5	-1.6	-2.8
B4	neutral 8	77.6	3.3	77.5	79.5	-2.6	-2.6	-4.1	-6.8
C4	neutral 6.5	65.3	4.7	65.0	67.7	-3.8	-4.3	-1.4	-5.1
D4	neutral 5	66.1	5.0	47.4	50.8	-3.1	-3.9	-0.4	-4.0
E4	neutral 3.5	62.9	5.6	32.5	36.5	-2.5	-3.6	-1.6	-5.4
F4	black	62.1	5.5	19.2	22.9	-1.4	-3.0	-1.8	-5.6
A5	paper white	100.0	0.5	95.0	95.4	0.5	0.4	-3.1	-2.9
B5	Skin highlight L*=88	64.5	6.2	84.5	86.1	10.8	9.5	11.2	5.3
C5	Skin highlight L* =75	65.7	8.9	72.4	75.2	16.2	14.0	16.7	8.5
D5	Skin shadow L*=28	86.3	3.9	24.0	27.3	8.3	7.6	8.4	6.4
E5	Skin shadow L*=13	88.9	2.6	14.0	16.0	6.0	6.0	3.6	5.1
F5	Maximum Black	91.3	2.0	10.4	12.0	0.4	-0.7	-2.0	-2.8
Summary Results		I* Color	I* tone	ΔE	60 Megalux hours				
Average Score for all patches		81.2	92.0	5.5					
Worst 10% (3 lowest scoring patches)		62.6	87.7	9.1					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating

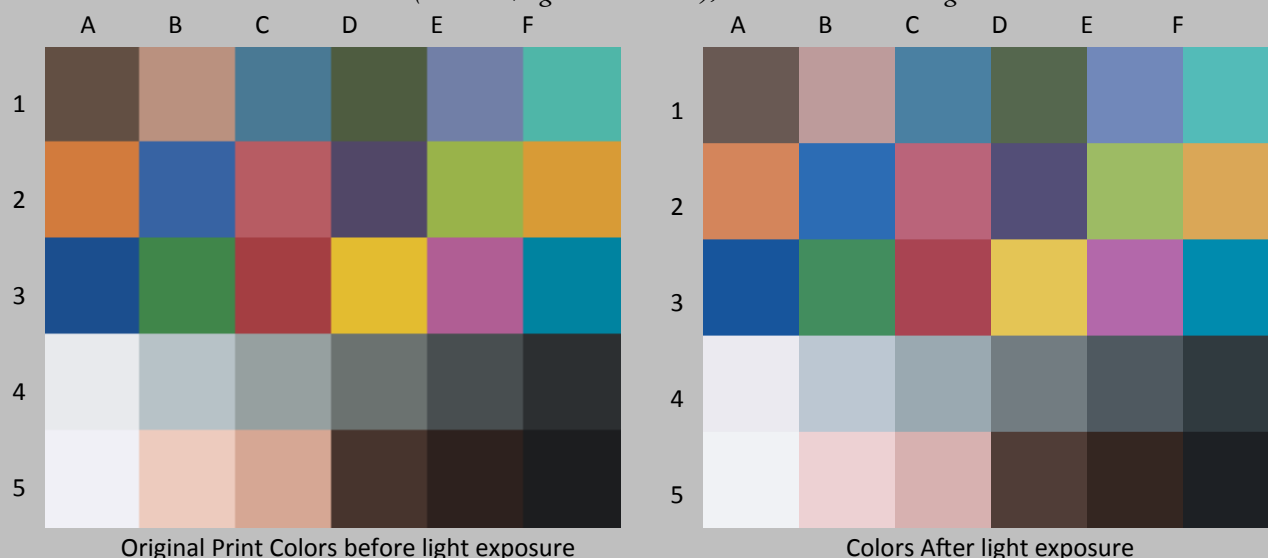


Original Print Colors before light exposure

Colors After light exposure

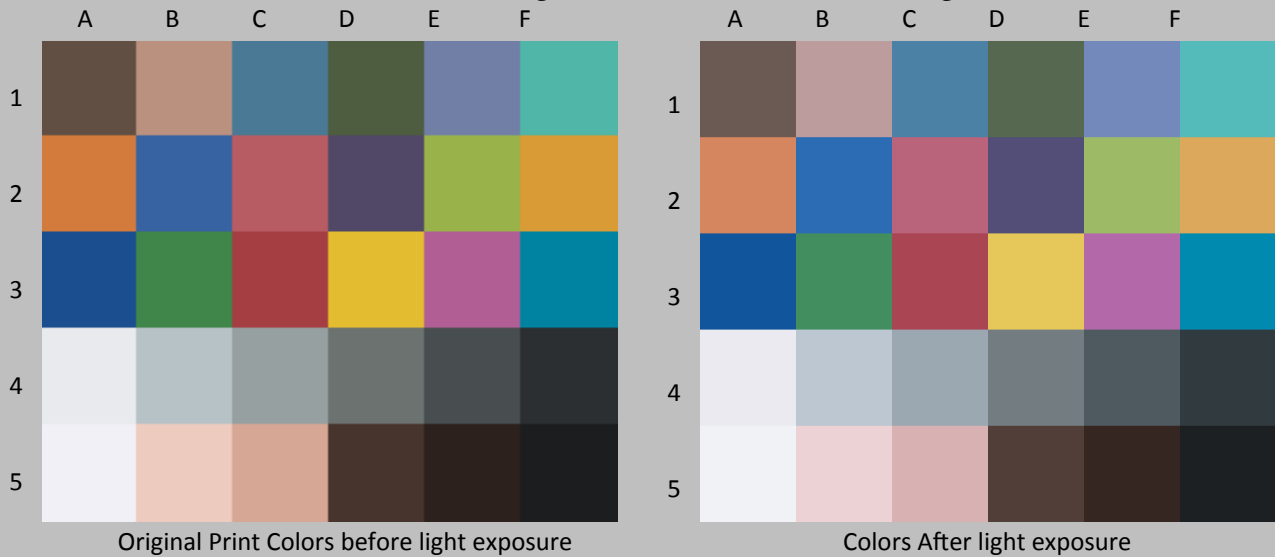
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	75.6	4.9	35.2	38.7	7.0	6.1	10.2	6.8
B1	Light Skin	64.3	8.6	63.8	66.7	14.4	12.7	15.8	7.8
C1	Blue sky	87.5	4.1	48.2	50.6	-10.7	-12.1	-19.8	-22.8
D1	Foliage	89.3	4.3	37.3	41.0	-9.8	-10.9	14.3	12.2
E1	blue flower	84.1	5.0	53.4	56.2	1.9	0.3	-22.9	-26.8
F1	bluish green	89.4	4.3	67.7	69.2	-33.6	-32.4	-2.4	-6.3
A1	orange	84.1	9.9	60.6	63.1	30.9	27.9	48.0	39.0
B2	purplish blue	91.0	4.8	41.2	43.7	1.0	-1.6	-40.2	-43.4
C2	moderate red	81.4	8.3	50.5	52.8	38.1	36.7	13.7	5.8
D2	purple	78.4	5.3	32.3	34.6	10.4	9.9	-16.9	-21.6
E2	yellow green	88.0	7.2	69.3	71.5	-21.2	-21.2	48.8	41.9
F2	orange yellow	85.6	9.8	68.8	71.7	16.9	13.7	58.9	50.1
A3	blue	91.7	4.7	32.4	35.0	2.1	0.8	-40.6	-44.3
B3	green	88.8	5.7	50.1	52.6	-33.0	-33.5	24.6	19.5
C3	red	90.4	5.5	41.3	43.3	43.2	43.0	20.7	15.6
D3	yellow	87.9	9.3	78.1	80.4	4.6	2.0	69.9	61.3
E3	magenta	87.2	6.4	51.4	54.0	39.1	36.9	-14.4	-19.8
F3	cyan	94.9	3.1	49.9	52.0	-24.4	-25.1	-25.1	-27.3
A4	white	88.8	1.6	92.4	92.6	0.3	0.1	-1.6	-0.1
B4	neutral 8	100.0	1.6	77.5	79.1	-2.6	-2.8	-4.1	-4.5
C4	neutral 6.5	79.7	3.5	65.0	67.6	-3.8	-4.3	-1.4	-3.7
D4	neutral 5	76.8	4.3	47.4	50.8	-3.1	-3.9	-0.4	-3.0
E4	neutral 3.5	72.1	5.2	32.5	36.6	-2.5	-3.7	-1.6	-4.5
F4	black	69.4	5.2	19.2	23.1	-1.4	-3.0	-1.8	-4.8
A5	paper white	71.5	3.2	95.0	94.8	0.5	0.0	-3.1	0.1
B5	Skin highlight L*=88	73.8	4.8	84.5	85.7	10.8	9.5	11.2	6.8
C5	Skin highlight L* =75	68.2	8.3	72.4	75.0	16.2	14.2	16.7	9.1
D5	Skin shadow L*=28	89.9	3.8	24.0	27.4	8.3	7.7	8.4	6.8
E5	Skin shadow L*=13	84.7	2.9	14.0	16.2	6.0	6.1	3.6	5.5
F5	Maximum Black	91.7	1.9	10.4	11.8	0.4	-0.8	-2.0	-2.6
Summary Results		I* Color	I* tone	ΔE	70 Megalux hours				
Average Score for all patches		83.5	91.2	5.3					
Worst 10% (3 lowest scoring patches)		67.3	85.9	9.6					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



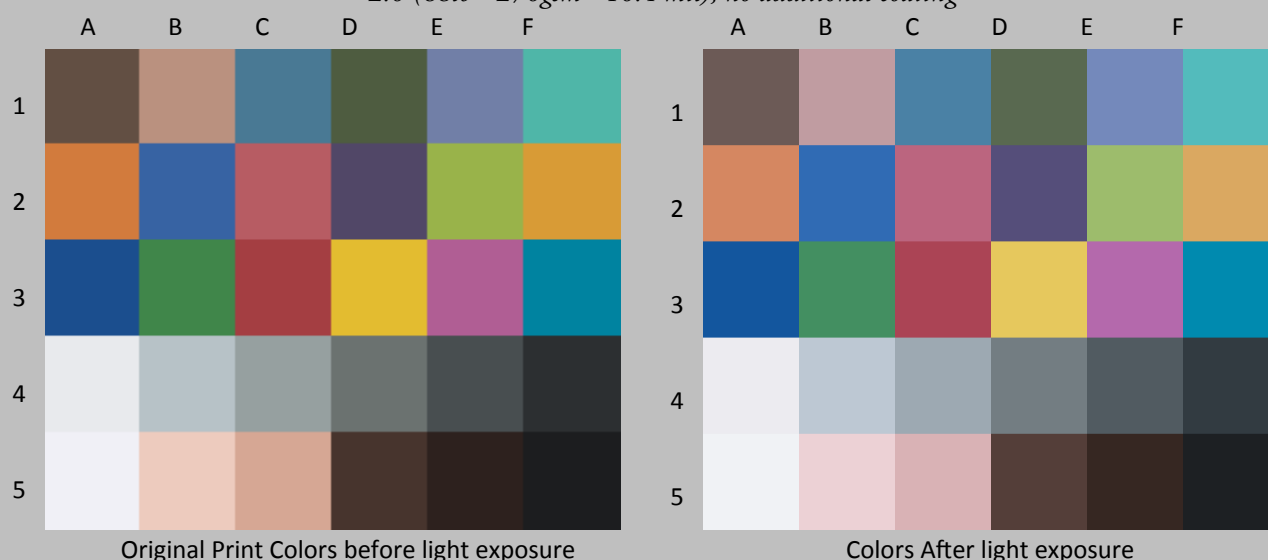
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	68.9	5.9	35.2	39.2	7.0	6.4	10.2	5.9
B1	Light Skin	51.8	11.3	63.8	67.2	14.4	13.0	15.8	5.1
C1	Blue sky	81.9	5.4	48.2	51.1	-10.7	-11.4	-19.8	-24.3
D1	Foliage	87.7	5.1	37.3	41.7	-9.8	-10.7	14.3	11.8
E1	blue flower	76.4	6.8	53.4	56.6	1.9	1.2	-22.9	-28.8
F1	bluish green	82.9	6.6	67.7	69.7	-33.6	-31.7	-2.4	-8.3
A1	orange	79.8	12.4	60.6	63.7	30.9	27.6	48.0	36.5
B2	purplish blue	89.3	5.7	41.2	44.1	1.0	-0.6	-40.2	-44.8
C2	moderate red	76.4	10.4	50.5	53.2	38.1	36.8	13.7	3.7
D2	purple	72.8	6.5	32.3	35.0	10.4	10.2	-16.9	-22.8
E2	yellow green	84.0	9.4	69.3	72.1	-21.2	-21.3	48.8	39.8
F2	orange yellow	81.4	12.4	68.8	72.2	16.9	13.2	58.9	47.6
A3	blue	89.3	5.7	32.4	35.3	2.1	1.5	-40.6	-45.5
B3	green	86.3	6.8	50.1	53.1	-33.0	-33.4	24.6	18.4
C3	red	87.7	6.8	41.3	43.6	43.2	43.2	20.7	14.3
D3	yellow	84.2	11.9	78.1	81.0	4.6	1.5	69.9	58.8
E3	magenta	82.9	8.2	51.4	54.4	39.1	37.5	-14.4	-21.8
F3	cyan	91.5	4.3	49.9	52.4	-24.4	-24.5	-25.1	-28.5
A4	white	89.5	1.7	92.4	93.1	0.3	0.7	-1.6	-3.0
B4	neutral 8	73.3	3.7	77.5	79.7	-2.6	-2.1	-4.1	-7.1
C4	neutral 6.5	59.7	5.3	65.0	68.2	-3.8	-3.7	-1.4	-5.7
D4	neutral 5	67.0	5.4	47.4	51.4	-3.1	-3.4	-0.4	-4.0
E4	neutral 3.5	68.0	5.9	32.5	37.2	-2.5	-3.3	-1.6	-5.0
F4	black	68.9	5.6	19.2	23.5	-1.4	-2.8	-1.8	-5.0
A5	paper white	98.9	0.7	95.0	95.2	0.5	0.4	-3.1	-2.5
B5	Skin highlight L*=88	52.5	8.1	84.5	86.2	10.8	9.9	11.2	3.4
C5	Skin highlight L* =75	56.5	11.1	72.4	75.6	16.2	14.5	16.7	6.2
D5	Skin shadow L*=28	89.1	4.4	24.0	28.0	8.3	8.1	8.4	6.6
E5	Skin shadow L*=13	83.6	3.6	14.0	16.9	6.0	6.4	3.6	5.6
F5	Maximum Black	92.7	2.1	10.4	12.2	0.4	-0.6	-2.0	-2.7
Summary Results		I* Color	I* tone	ΔE	80 Megalux hours				
Average Score for all patches		78.5	90.2	6.6					
Worst 10% (3 lowest scoring patches)		53.6	84.9	12.2					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



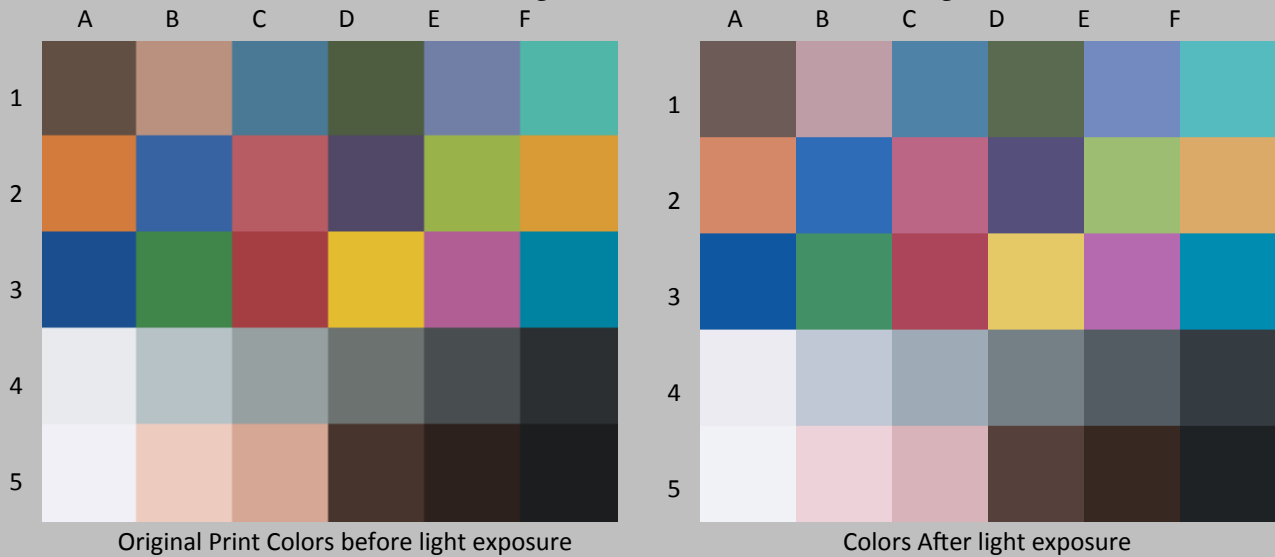
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	67.1	6.2	35.2	39.4	7.0	6.6	10.2	5.6
B1	Light Skin	46.3	12.5	63.8	67.5	14.4	13.4	15.8	3.9
C1	Blue sky	80.7	5.7	48.2	51.3	-10.7	-11.2	-19.8	-24.6
D1	Foliage	87.7	5.2	37.3	41.9	-9.8	-10.5	14.3	11.7
E1	blue flower	74.3	7.3	53.4	56.8	1.9	1.5	-22.9	-29.3
F1	bluish green	80.6	7.4	67.7	69.9	-33.6	-31.4	-2.4	-9.1
A1	orange	77.5	13.7	60.6	63.8	30.9	27.6	48.0	35.1
B2	purplish blue	88.8	5.9	41.2	44.2	1.0	-0.6	-40.2	-45.0
C2	moderate red	73.9	11.4	50.5	53.4	38.1	37.0	13.7	2.7
D2	purple	70.2	7.0	32.3	35.1	10.4	10.4	-16.9	-23.3
E2	yellow green	81.8	10.6	69.3	72.3	-21.2	-21.1	48.8	38.6
F2	orange yellow	79.0	13.8	68.8	72.5	16.9	13.3	58.9	46.0
A3	blue	88.4	6.0	32.4	35.4	2.1	1.6	-40.6	-45.8
B3	green	84.7	7.5	50.1	53.2	-33.0	-33.3	24.6	17.8
C3	red	86.4	7.4	41.3	43.7	43.2	43.3	20.7	13.7
D3	yellow	82.1	13.4	78.1	81.1	4.6	1.5	69.9	57.2
E3	magenta	81.5	8.8	51.4	54.5	39.1	37.7	-14.4	-22.5
F3	cyan	91.1	4.4	49.9	52.4	-24.4	-24.4	-25.1	-28.7
A4	white	88.8	1.7	92.4	93.1	0.3	0.8	-1.6	-3.1
B4	neutral 8	70.7	4.0	77.5	79.8	-2.6	-1.9	-4.1	-7.3
C4	neutral 6.5	55.5	5.7	65.0	68.3	-3.8	-3.4	-1.4	-6.1
D4	neutral 5	66.1	5.5	47.4	51.5	-3.1	-3.2	-0.4	-4.1
E4	neutral 3.5	69.7	5.9	32.5	37.4	-2.5	-3.1	-1.6	-4.9
F4	black	70.8	5.6	19.2	23.7	-1.4	-2.7	-1.8	-4.8
A5	paper white	97.8	0.7	95.0	95.2	0.5	0.4	-3.1	-2.4
B5	Skin highlight L*=88	45.8	9.1	84.5	86.3	10.8	10.2	11.2	2.3
C5	Skin highlight L* =75	51.8	12.2	72.4	75.7	16.2	14.8	16.7	5.1
D5	Skin shadow L*=28	89.9	4.5	24.0	28.1	8.3	8.3	8.4	6.7
E5	Skin shadow L*=13	81.4	3.6	14.0	16.8	6.0	6.6	3.6	5.8
F5	Maximum Black	93.2	1.9	10.4	11.9	0.4	-0.6	-2.0	-2.6
Summary Results		I* Color	I* tone	ΔE	90 Megalux hours				
Average Score for all patches		76.8	89.7	7.2					
Worst 10% (3 lowest scoring patches)		48.0	84.0	13.7					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



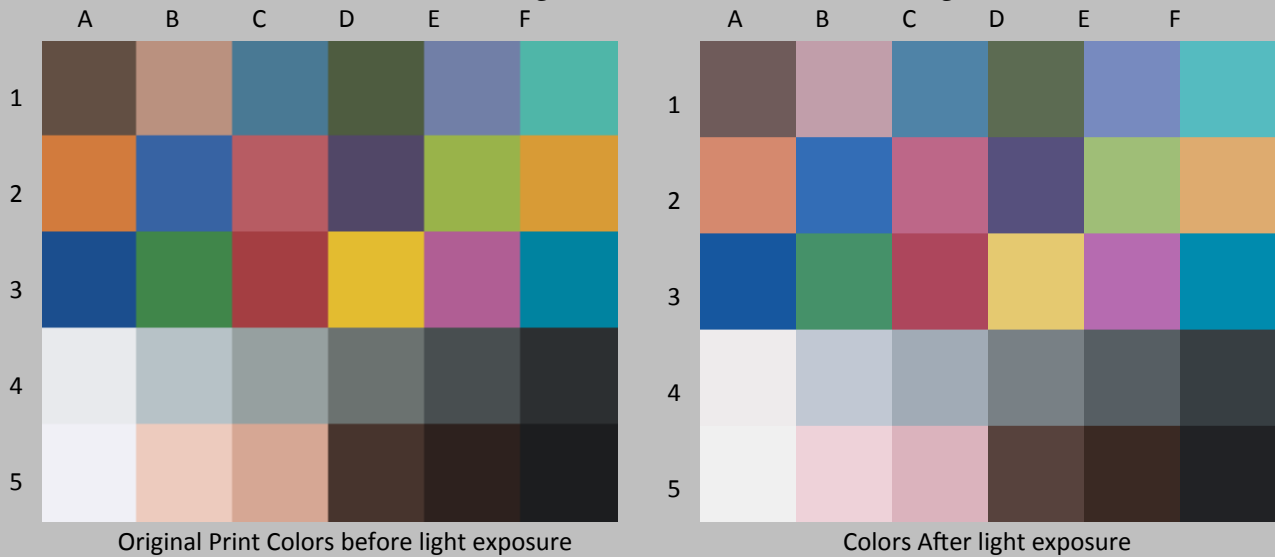
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	65.8	6.6	35.2	39.9	7.0	6.8	10.2	5.5
B1	Light Skin	41.1	13.6	63.8	67.7	14.4	13.7	15.8	2.7
C1	Blue sky	80.6	5.8	48.2	51.5	-10.7	-11.0	-19.8	-24.6
D1	Foliage	88.9	5.6	37.3	42.4	-9.8	-10.3	14.3	11.9
E1	blue flower	74.0	7.4	53.4	56.9	1.9	1.8	-22.9	-29.4
F1	bluish green	78.9	7.9	67.7	70.0	-33.6	-31.0	-2.4	-9.5
A1	orange	74.7	15.4	60.6	64.0	30.9	27.7	48.0	33.4
B2	purplish blue	89.0	5.9	41.2	44.4	1.0	-0.4	-40.2	-44.9
C2	moderate red	71.3	12.5	50.5	53.6	38.1	37.1	13.7	1.6
D2	purple	68.1	7.5	32.3	35.4	10.4	10.5	-16.9	-23.7
E2	yellow green	79.0	12.1	69.3	72.6	-21.2	-20.9	48.8	37.1
F2	orange yellow	76.1	15.6	68.8	72.7	16.9	13.3	58.9	44.2
A3	blue	87.9	6.2	32.4	35.6	2.1	1.7	-40.6	-46.0
B3	green	83.2	8.2	50.1	53.6	-33.0	-33.0	24.6	17.2
C3	red	84.7	8.3	41.3	43.9	43.2	43.5	20.7	12.9
D3	yellow	79.9	14.9	78.1	81.4	4.6	1.6	69.9	55.7
E3	magenta	80.9	9.1	51.4	54.8	39.1	37.9	-14.4	-22.8
F3	cyan	91.3	4.5	49.9	52.7	-24.4	-24.3	-25.1	-28.6
A4	white	95.6	1.2	92.4	93.2	0.3	0.7	-1.6	-2.4
B4	neutral 8	72.9	3.9	77.5	79.9	-2.6	-1.8	-4.1	-7.1
C4	neutral 6.5	54.3	6.0	65.0	68.6	-3.8	-3.2	-1.4	-6.2
D4	neutral 5	65.6	5.9	47.4	51.9	-3.1	-3.0	-0.4	-4.2
E4	neutral 3.5	71.8	6.3	32.5	37.9	-2.5	-2.9	-1.6	-4.7
F4	black	74.0	5.8	19.2	24.2	-1.4	-2.5	-1.8	-4.6
A5	paper white	90.4	1.4	95.0	95.2	0.5	0.3	-3.1	-1.7
B5	Skin highlight L*=88	43.4	9.5	84.5	86.4	10.8	10.2	11.2	1.9
C5	Skin highlight L* =75	48.4	13.0	72.4	76.0	16.2	15.0	16.7	4.2
D5	Skin shadow L*=28	89.5	4.9	24.0	28.6	8.3	8.6	8.4	6.7
E5	Skin shadow L*=13	76.2	4.3	14.0	17.3	6.0	7.0	3.6	6.2
F5	Maximum Black	94.1	2.2	10.4	12.4	0.4	-0.6	-2.0	-2.4
Summary Results		I* Color	I* tone	ΔE	100 Megalux hours				
Average Score for all patches		75.7	88.9	7.7					
Worst 10% (3 lowest scoring patches)		44.3	82.6	15.3					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



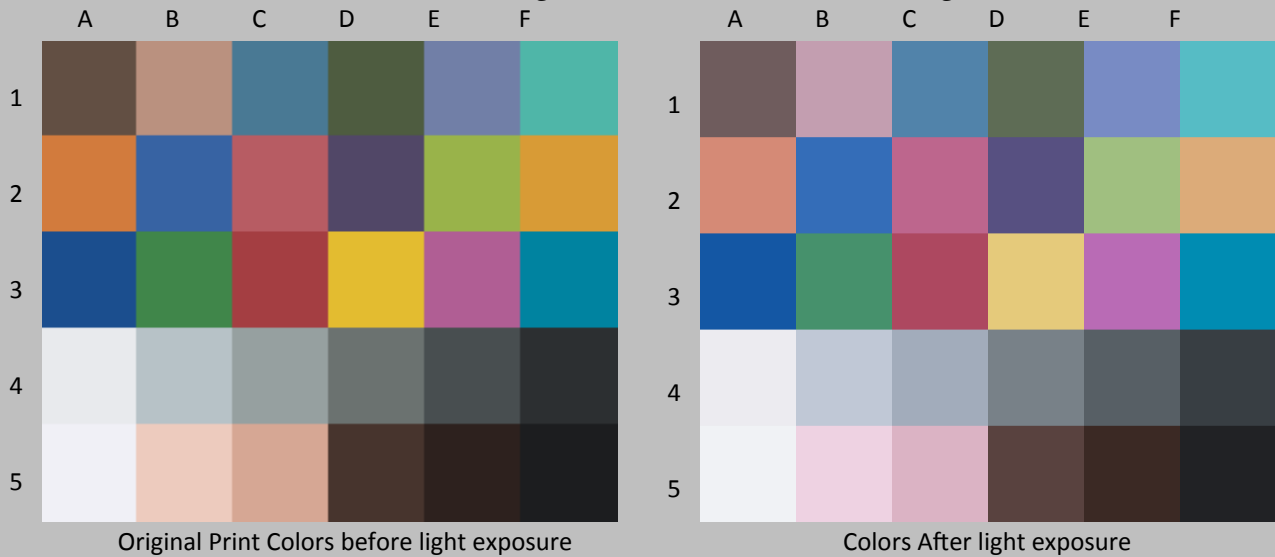
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	59.4	7.5	35.2	40.3	7.0	7.2	10.2	4.7
B1	Light Skin	29.5	16.1	63.8	68.3	14.4	14.4	15.8	0.2
C1	Blue sky	76.9	6.7	48.2	51.8	-10.7	-10.5	-19.8	-25.4
D1	Foliage	87.4	6.2	37.3	42.9	-9.8	-10.1	14.3	11.6
E1	blue flower	69.1	8.6	53.4	57.3	1.9	2.5	-22.9	-30.5
F1	bluish green	73.6	9.7	67.7	70.3	-33.6	-30.2	-2.4	-11.2
A1	orange	69.1	18.5	60.6	64.4	30.9	27.7	48.0	30.2
B2	purplish blue	87.5	6.5	41.2	44.7	1.0	0.0	-40.2	-45.7
C2	moderate red	65.4	14.9	50.5	54.0	38.1	37.5	13.7	-0.8
D2	purple	61.8	8.8	32.3	35.7	10.4	11.0	-16.9	-24.9
E2	yellow green	73.8	14.9	69.3	73.1	-21.2	-20.5	48.8	34.3
F2	orange yellow	70.6	19.0	68.8	73.2	16.9	13.4	58.9	40.7
A3	blue	86.2	7.1	32.4	36.0	2.1	2.2	-40.6	-46.8
B3	green	78.5	10.2	50.1	54.1	-33.0	-32.6	24.6	15.2
C3	red	81.1	10.0	41.3	44.4	43.2	43.6	20.7	11.2
D3	yellow	74.4	18.8	78.1	81.9	4.6	1.6	69.9	51.7
E3	magenta	77.9	10.4	51.4	55.3	39.1	38.4	-14.4	-24.1
F3	cyan	89.4	5.2	49.9	53.0	-24.4	-23.7	-25.1	-29.2
A4	white	92.0	1.6	92.4	93.3	0.3	0.8	-1.6	-2.7
B4	neutral 8	64.5	4.7	77.5	80.2	-2.6	-1.3	-4.1	-7.8
C4	neutral 6.5	42.9	7.2	65.0	69.0	-3.8	-2.6	-1.4	-7.2
D4	neutral 5	60.2	6.6	47.4	52.5	-3.1	-2.5	-0.4	-4.6
E4	neutral 3.5	71.5	6.8	32.5	38.6	-2.5	-2.6	-1.6	-4.8
F4	black	76.5	6.2	19.2	24.8	-1.4	-2.4	-1.8	-4.4
A5	paper white	93.5	1.2	95.0	95.3	0.5	0.3	-3.1	-2.0
B5	Skin highlight L*=88	30.2	11.6	84.5	86.7	10.8	10.6	11.2	-0.2
C5	Skin highlight L* =75	38.7	15.3	72.4	76.4	16.2	15.5	16.7	1.9
D5	Skin shadow L*=28	87.8	5.6	24.0	29.3	8.3	8.9	8.4	6.6
E5	Skin shadow L*=13	70.8	5.1	14.0	17.9	6.0	7.2	3.6	6.6
F5	Maximum Black	95.1	2.6	10.4	12.8	0.4	-0.6	-2.0	-2.2
Summary Results		I* Color	I* tone	ΔE	120 Megalux hours				
Average Score for all patches		71.2	87.8	9.1					
Worst 10% (3 lowest scoring patches)		32.8	81.1	18.8					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



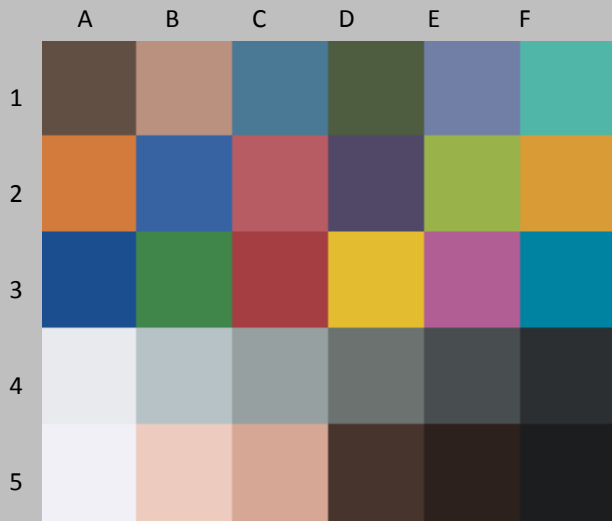
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	55.9	8.2	35.2	40.9	7.0	7.6	10.2	4.3
B1	Light Skin	22.8	17.6	63.8	68.6	14.4	15.2	15.8	-1.2
C1	Blue sky	79.1	6.4	48.2	52.0	-10.7	-10.3	-19.8	-24.9
D1	Foliage	88.1	6.7	37.3	43.6	-9.8	-9.6	14.3	11.7
E1	blue flower	71.3	8.2	53.4	57.6	1.9	2.8	-22.9	-30.0
F1	bluish green	71.7	10.4	67.7	70.4	-33.6	-29.6	-2.4	-11.6
A1	orange	63.8	21.6	60.6	64.8	30.9	28.1	48.0	27.0
B2	purplish blue	89.8	5.9	41.2	44.9	1.0	-0.2	-40.2	-44.7
C2	moderate red	61.9	16.4	50.5	54.3	38.1	38.0	13.7	-2.3
D2	purple	61.1	9.0	32.3	36.1	10.4	11.3	-16.9	-25.0
E2	yellow green	69.0	17.5	69.3	73.3	-21.2	-19.8	48.8	31.8
F2	orange yellow	65.6	22.1	68.8	73.6	16.9	13.8	58.9	37.5
A3	blue	87.2	6.8	32.4	36.2	2.1	2.0	-40.6	-46.4
B3	green	75.5	11.4	50.1	54.4	-33.0	-32.0	24.6	14.1
C3	red	79.0	11.1	41.3	44.8	43.2	43.7	20.7	10.2
D3	yellow	69.3	22.4	78.1	82.1	4.6	2.0	69.9	48.0
E3	magenta	79.2	10.1	51.4	55.6	39.1	38.5	-14.4	-23.5
F3	cyan	91.9	4.6	49.9	53.1	-24.4	-23.8	-25.1	-28.3
A4	white	92.4	1.5	92.4	93.2	0.3	0.6	-1.6	-0.4
B4	neutral 8	79.0	3.7	77.5	80.3	-2.6	-1.2	-4.1	-6.2
C4	neutral 6.5	48.4	6.9	65.0	69.3	-3.8	-2.2	-1.4	-6.5
D4	neutral 5	64.8	6.7	47.4	52.9	-3.1	-2.1	-0.4	-4.1
E4	neutral 3.5	79.1	7.1	32.5	39.2	-2.5	-2.3	-1.6	-4.1
F4	black	84.3	6.6	19.2	25.5	-1.4	-2.1	-1.8	-3.7
A5	paper white	70.3	3.3	95.0	95.1	0.5	0.1	-3.1	0.2
B5	Skin highlight L*=88	29.8	11.6	84.5	86.7	10.8	10.8	11.2	-0.2
C5	Skin highlight L* =75	34.7	16.3	72.4	76.7	16.2	16.0	16.7	1.0
D5	Skin shadow L*=28	87.1	6.3	24.0	30.0	8.3	9.4	8.4	6.7
E5	Skin shadow L*=13	65.0	6.0	14.0	18.6	6.0	7.7	3.6	7.0
F5	Maximum Black	97.2	3.0	10.4	13.4	0.4	-0.4	-2.0	-1.9
Summary Results		I* Color	I* tone	ΔE	140 Megalux hours				
Average Score for all patches		70.5	86.6	9.9					
Worst 10% (3 lowest scoring patches)		29.1	79.1	22.0					

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Red River Ultra Pro Satin 2.0 (68lb - 270gsm - 10.4 mil), no additional coating



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	47.1	9.3	35.2	41.4	7.0	8.0	10.2	3.2
B1	Light Skin	8.5	20.7	63.8	69.2	14.4	16.1	15.8	-4.2
C1	Blue sky	73.3	7.7	48.2	52.4	-10.7	-9.5	-19.8	-26.1
D1	Foliage	84.0	7.4	37.3	44.0	-9.8	-9.3	14.3	11.0
E1	blue flower	63.6	10.0	53.4	58.0	1.9	3.9	-22.9	-31.6
F1	bluish green	63.7	13.0	67.7	70.7	-33.6	-28.6	-2.4	-14.1
A1	orange	56.6	25.7	60.6	65.0	30.9	28.4	48.0	22.9
B2	purplish blue	86.6	7.1	41.2	45.1	1.0	0.7	-40.2	-46.1
C2	moderate red	53.9	19.6	50.5	54.7	38.1	38.6	13.7	-5.5
D2	purple	52.2	10.8	32.3	36.3	10.4	11.9	-16.9	-26.7
E2	yellow green	61.6	21.4	69.3	73.7	-21.2	-19.3	48.8	27.9
F2	orange yellow	57.8	26.9	68.8	73.9	16.9	14.0	58.9	32.7
A3	blue	83.4	8.3	32.4	36.4	2.1	3.0	-40.6	-47.9
B3	green	69.6	13.8	50.1	54.7	-33.0	-31.5	24.6	11.7
C3	red	74.1	13.4	41.3	45.0	43.2	44.0	20.7	7.9
D3	yellow	61.8	27.6	78.1	82.4	4.6	2.1	69.9	42.8
E3	magenta	73.5	12.4	51.4	56.0	39.1	39.5	-14.4	-25.9
F3	cyan	87.5	6.0	49.9	53.4	-24.4	-22.9	-25.1	-29.7
A4	white	95.1	1.4	92.4	93.3	0.3	0.9	-1.6	-2.4
B4	neutral 8	58.9	5.3	77.5	80.5	-2.6	-0.6	-4.1	-8.0
C4	neutral 6.5	24.1	9.0	65.0	69.7	-3.8	-1.4	-1.4	-8.7
D4	neutral 5	49.8	7.9	47.4	53.3	-3.1	-1.5	-0.4	-5.4
E4	neutral 3.5	73.1	7.7	32.5	39.6	-2.5	-1.9	-1.6	-4.6
F4	black	84.4	7.0	19.2	25.9	-1.4	-1.9	-1.8	-3.7
A5	paper white	90.7	1.4	95.0	95.2	0.5	0.3	-3.1	-1.7
B5	Skin highlight L*=88	6.3	15.3	84.5	86.9	10.8	11.5	11.2	-3.9
C5	Skin highlight L* =75	19.1	19.9	72.4	77.0	16.2	16.8	16.7	-2.6
D5	Skin shadow L*=28	81.8	7.0	24.0	30.5	8.3	9.7	8.4	6.2
E5	Skin shadow L*=13	59.8	6.6	14.0	18.9	6.0	8.1	3.6	7.3
F5	Maximum Black	97.7	3.1	10.4	13.5	0.4	-0.3	-2.0	-1.8
Summary Results		I* Color	I* tone	ΔE	160 Megalux hours				
Average Score for all patches		63.3	85.6	11.7					
Worst 10% (3 lowest scoring patches)		11.3	78.2	26.7					

The 180 Megalux hour Update will be posted on approximately DEC 20, 2017.



Original Print Colors before light exposure



Colors After light exposure

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin			35.2		7.0		10.2	
B1	Light Skin			63.8		14.4		15.8	
C1	Blue sky			48.2		-10.7		-19.8	
D1	Foliage			37.3		-9.8		14.3	
E1	blue flower			53.4		1.9		-22.9	
F1	bluish green			67.7		-33.6		-2.4	
A1	orange			60.6		30.9		48.0	
B2	purplish blue			41.2		1.0		-40.2	
C2	moderate red			50.5		38.1		13.7	
D2	purple			32.3		10.4		-16.9	
E2	yellow green			69.3		-21.2		48.8	
F2	orange yellow			68.8		16.9		58.9	
A3	blue			32.4		2.1		-40.6	
B3	green			50.1		-33.0		24.6	
C3	red			41.3		43.2		20.7	
D3	yellow			78.1		4.6		69.9	
E3	magenta			51.4		39.1		-14.4	
F3	cyan			49.9		-24.4		-25.1	
A4	white			92.4		0.3		-1.6	
B4	neutral 8			77.5		-2.6		-4.1	
C4	neutral 6.5			65.0		-3.8		-1.4	
D4	neutral 5			47.4		-3.1		-0.4	
E4	neutral 3.5			32.5		-2.5		-1.6	
F4	black			19.2		-1.4		-1.8	
A5	paper white			95.0		0.5		-3.1	
B5	Skin highlight L*=88			84.5		10.8		11.2	
C5	Skin highlight L* =75			72.4		16.2		16.7	
D5	Skin shadow L*=28			24.0		8.3		8.4	
E5	Skin shadow L*=13			14.0		6.0		3.6	
F5	Maximum Black			10.4		0.4		-2.0	
Summary Results		I* Color	I* tone	ΔE	180 Megalux hours				
Average Score for all patches									
Worst 10% (3 lowest scoring patches)									