Aardenburg
144

IMAGING & ARCHIVES

Tested System:
ID#:278

Printer: Epson Stylus Photo R3000

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

Media: Epson Ultra Premium Photo Paper Glossy

Coating(s): no additional coating

Sample #: AaI_20121130_SN005

Testing Status: 160 Megalux hours total light exposure

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

Conservation Display Rating (CDR)

Lower limit: 11 Megalux hours (for weakest 10% of the color patches)
Upper limit: 15 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 furhter explanation of the Conservation display ratings.

http://www.aardenburg-imaging.com

Aardenburg Imaging & Archives

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_SN005** **Batch #:** M1
Printer:	Epson Stylus Photo R3000
Ink:	ConeColorPro® ink (for Epson R3000 printer)
Media:	Epson Ultra Premium Photo Paper Glossy
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:	SPR3000PremiumGlossy.icc **Rendering** n.a.
Profile type:	substitute* (see notes on page 5)

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

Optical Brighteners Present? *yes (high)*	**L***		**a***		**b***	
Media Whitepoint Color	UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
	97.0	96.7	1.6	-0.4	-6.8	1.0
	UV-inc/UV-exc ΔL*, Δa*, Δb* respectively					
	0.3		2.0		7.8	
	Calculated differences, especially for Δb, indicate the role and magnitude of fluorescence on original paper color*					
Maximum Printed Black	**L***	**a***	**b***	Optical Density (Dmax)		
	9.3	0.2	-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: 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.

Replicates/Compare to:

Compare to sample # AaI_20121214_SN002 – printed on an Epson Stylus Pro 3880 using the same paper type (i.e., Epson Ultra Premium Photo Paper Glossy) and using Epson OEM UltraChrome K3™ with Vivid Magenta pigmented ink set. Both samples have been run side-by-side as a direct paired-comparison light fade test.

See also sample # AaI_20121130_SN002 – printed on the same R3000 printer with same batch of ConeColorPro® ink, but using Red River Ultra Pro Satin 2.0 paper.

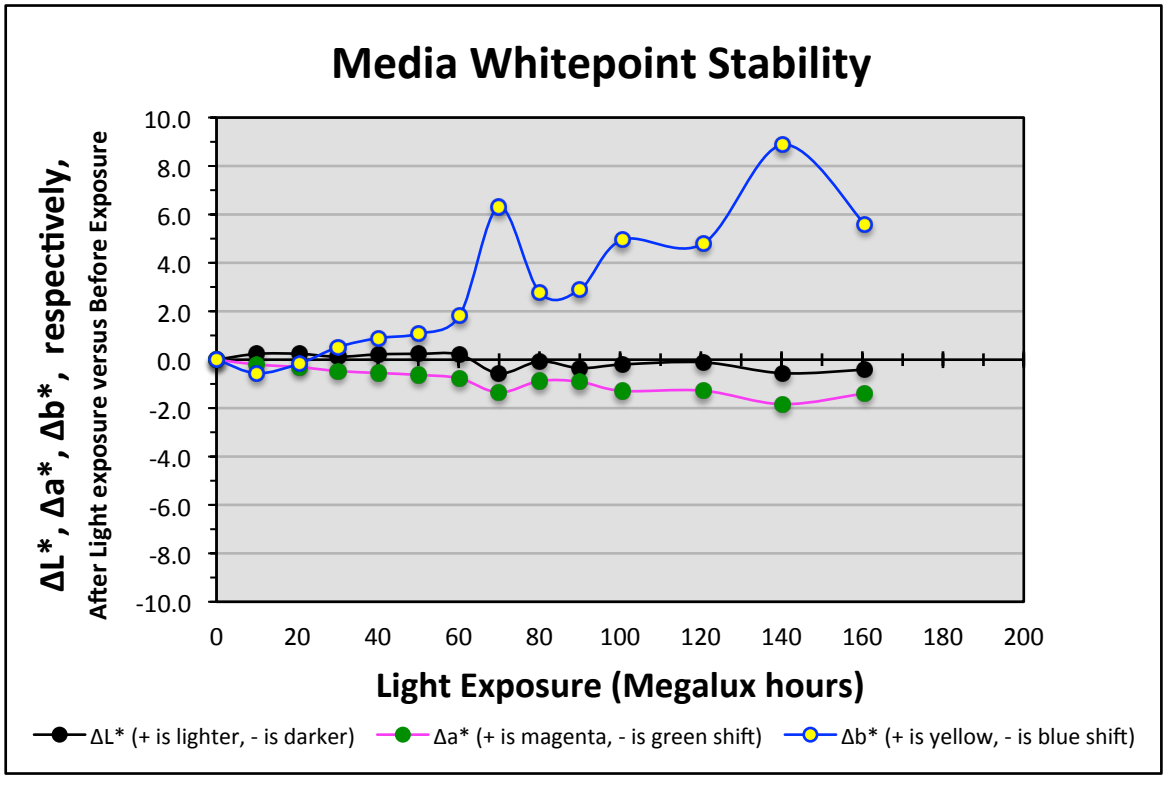
Notes/Comments:

* a generic Epson profile for the R3000/OEM ink/Epson Ultra Premium Photo Paper Glossy was used as a proxy for the Conecolor Pro ink printing on this Printer/paper combination. Initial image color and tonal accuracy was judged satisfactory for the purposes of this light fade test.

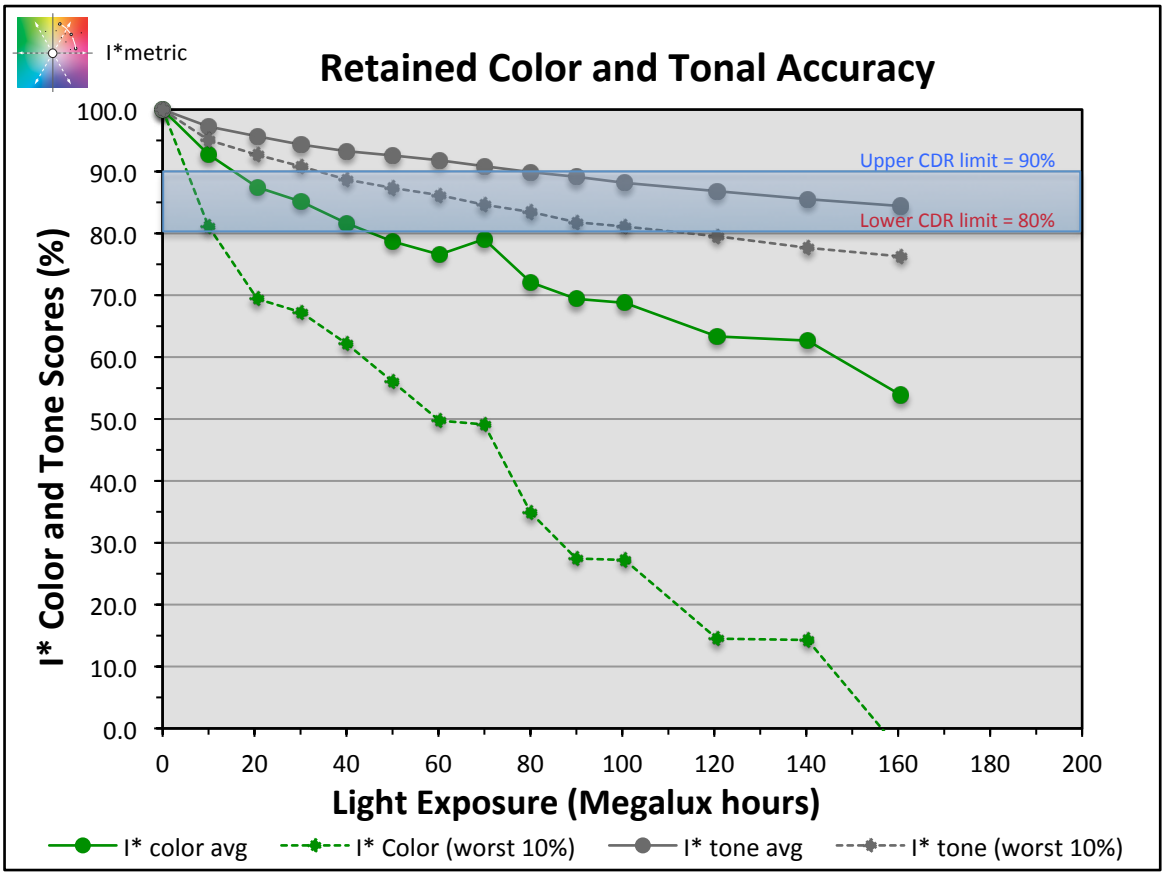
MHMG 2015-06-07: The significant jump in b* value on the whitephoint stability graphs at 70 Mluxhrs and partial recovery at 80 Mluxhrs were not measurement errors. The 70 Mluxhr measurements was delayed approximately six weeks after removing the sample from the light fade unit. The temporary "dark storage" 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 flourescence 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 ia 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.

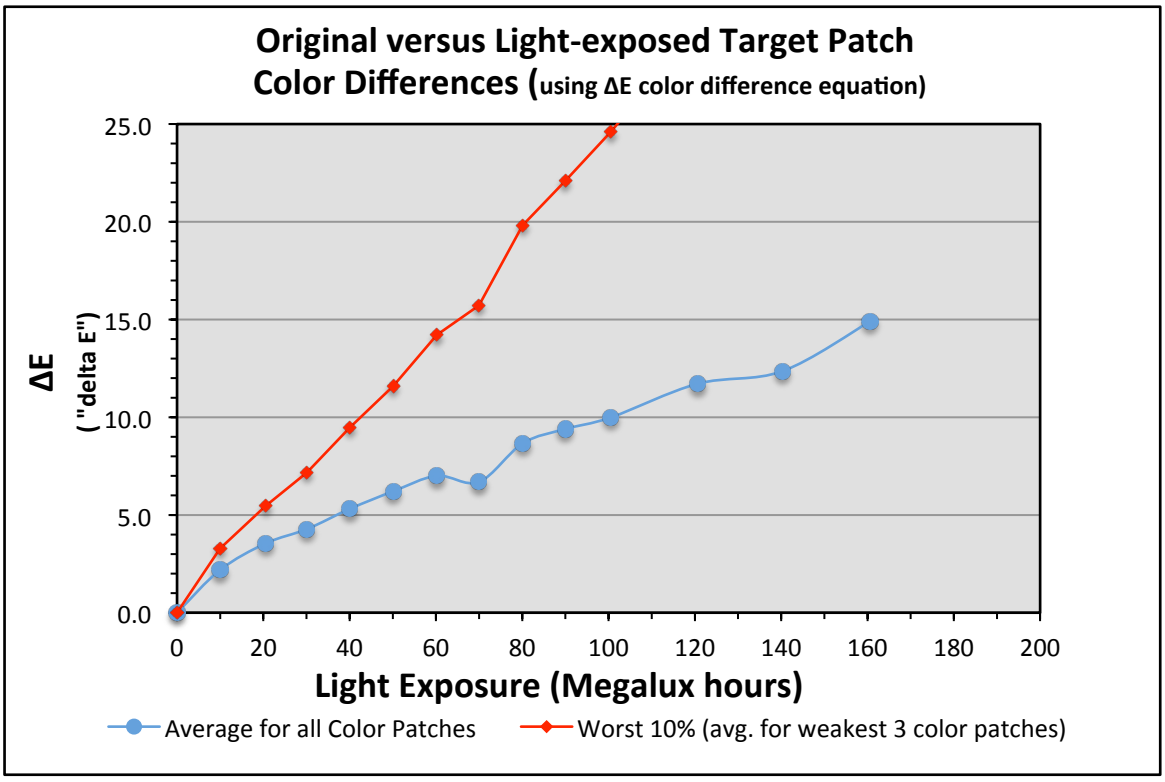
Graphs:

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating

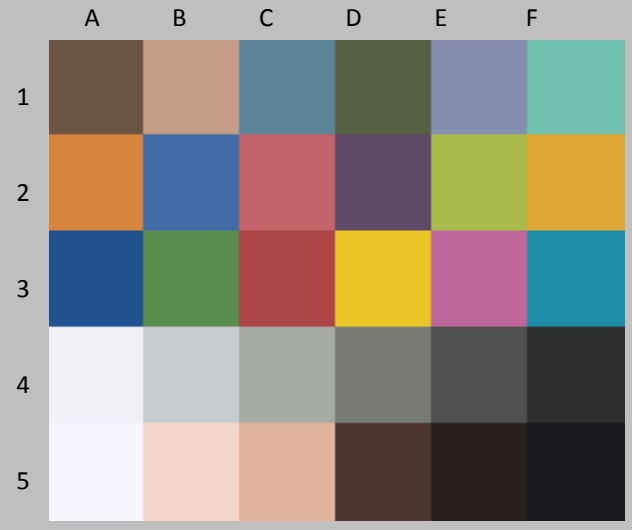


Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating

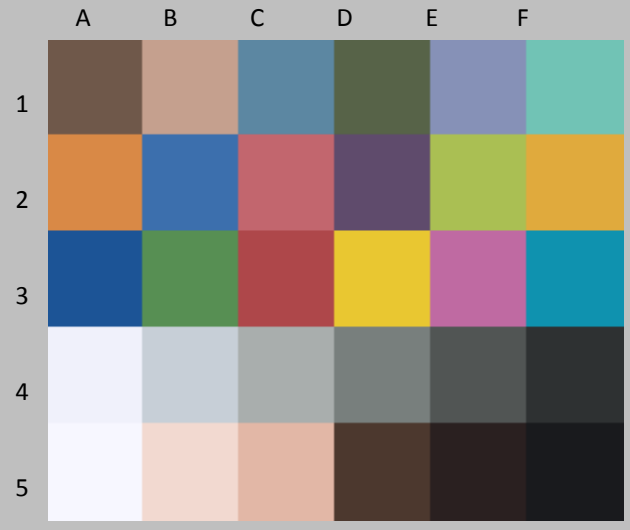




Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure



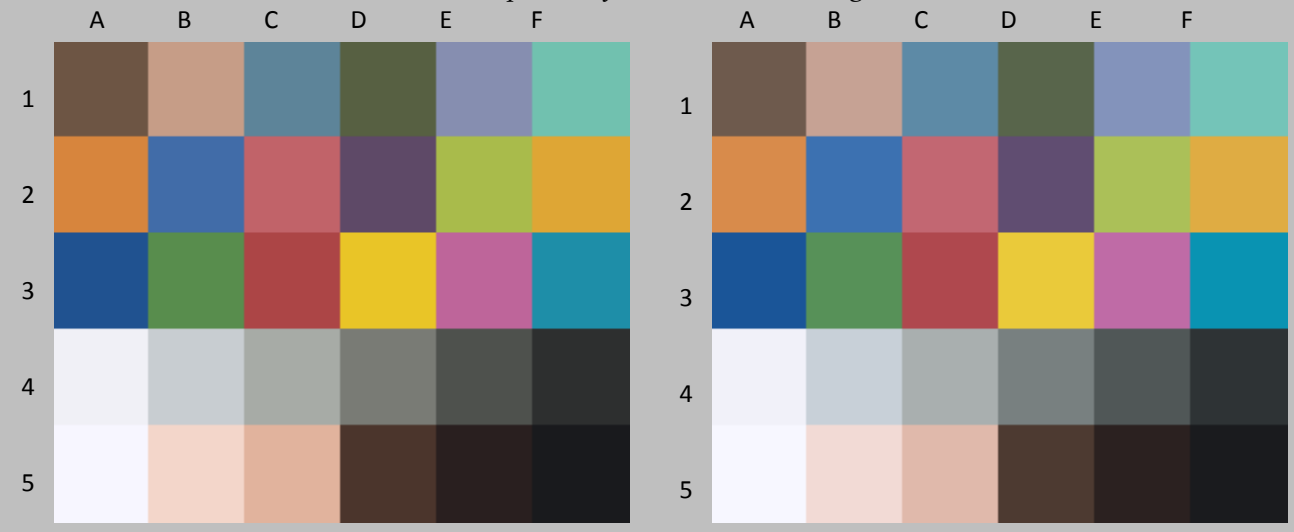
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	92.5	2.0	38.5	39.6	8.1	7.5	13.7	12.1
B1	Light Skin	88.8	3.2	68.0	69.2	13.4	12.2	18.2	15.4
C1	Blue sky	89.6	2.7	53.1	54.2	-9.5	-10.0	-16.2	-18.6
D1	Foliage	93.1	2.1	39.2	40.4	-8.2	-9.0	15.9	14.4
E1	blue flower	88.9	2.9	59.1	60.3	2.6	1.7	-18.9	-21.4
F1	bluish green	94.5	2.2	72.6	73.3	-28.7	-28.6	0.7	-1.4
A1	orange	96.6	2.6	63.6	64.6	28.2	27.0	50.5	48.4
B2	purplish blue	94.9	2.6	44.6	45.6	-1.3	-1.7	-36.6	-38.9
C2	moderate red	94.7	2.8	53.6	54.4	38.9	38.2	15.4	12.7
D2	purple	93.0	2.1	34.3	35.1	14.0	14.0	-14.5	-16.4
E2	yellow green	97.5	2.1	73.1	74.0	-18.1	-18.7	52.7	50.9
F2	orange yellow	96.9	2.7	72.3	73.2	14.5	13.2	63.0	60.8
A3	blue	96.2	2.2	34.0	34.9	1.0	1.1	-39.7	-41.7
B3	green	96.4	2.1	53.7	54.5	-28.1	-28.7	27.7	25.8
C3	red	97.5	1.8	44.1	44.8	42.7	42.6	22.5	20.8
D3	yellow	97.5	2.6	80.6	81.6	3.2	1.8	75.1	73.2
E3	magenta	94.1	3.2	55.0	56.0	41.2	40.4	-11.7	-14.6
F3	cyan	95.0	2.4	54.3	55.3	-24.5	-24.5	-22.9	-25.1
A4	white	93.2	1.2	94.8	95.2	1.2	1.0	-3.5	-4.6
B4	neutral 8	85.6	2.1	81.9	82.8	-1.1	-1.6	-2.7	-4.5
C4	neutral 6.5	82.0	2.4	69.5	70.5	-1.8	-2.4	1.7	-0.5
D4	neutral 5	80.0	2.7	51.2	52.4	-2.1	-2.6	2.7	0.4
E4	neutral 3.5	81.4	2.6	34.2	35.6	-1.9	-2.5	2.2	0.0
F4	black	91.2	1.6	19.3	20.1	-0.8	-1.3	0.3	-0.9
A5	paper white	99.0	0.6	97.3	97.6	1.9	1.7	-6.4	-7.0
B5	Skin highlight L*=88	85.6	2.6	87.7	88.6	9.4	8.4	9.8	7.5
C5	Skin highlight L* =75	88.5	3.4	76.7	77.9	15.0	13.7	18.2	15.3
D5	Skin shadow L*=28	98.3	1.2	24.7	25.7	8.7	8.4	10.3	9.7
E5	Skin shadow L*=13	100.0	0.6	12.8	13.2	4.7	4.9	1.9	2.3
F5	Maximum Black	100.0	0.2	9.3	9.5	0.2	0.1	-1.9	-2.0

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	92.8	97.3	2.2
Worst 10% (3 lowest scoring patches)	81.1	95.1	3.3

10 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

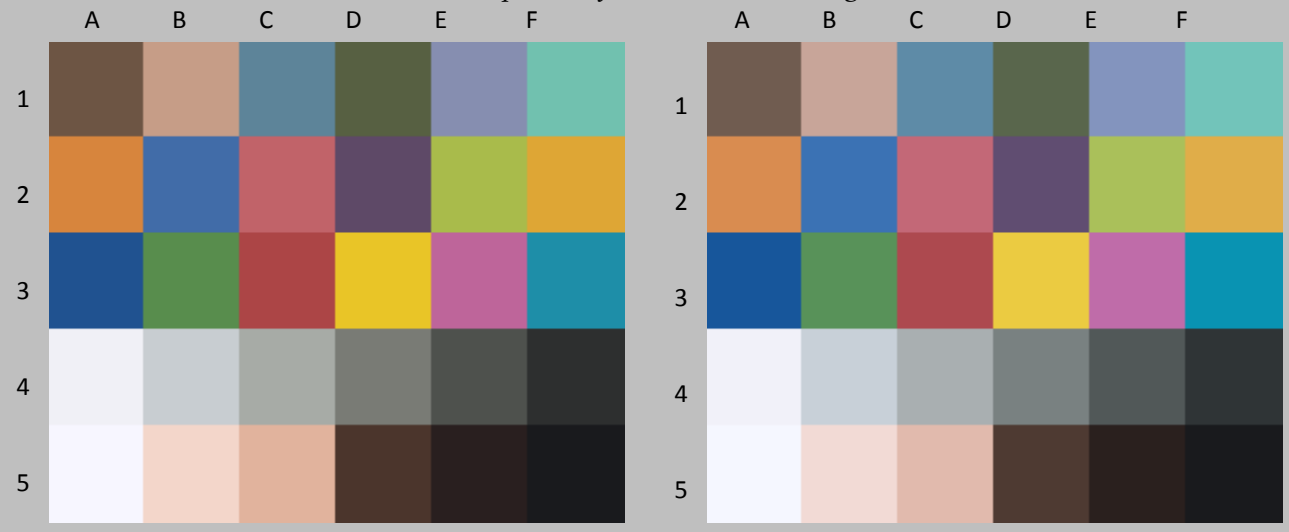
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Dark Skin	83.9	3.5	38.5	40.2	8.1	7.3	13.7	10.7
B1	Light Skin	78.1	5.8	68.0	69.9	13.4	11.6	18.2	13.1
C1	Blue sky	83.5	4.0	53.1	54.7	-9.5	-10.2	-16.2	-19.7
D1	Foliage	87.9	3.3	39.2	41.2	-8.2	-9.2	15.9	13.5
E1	blue flower	80.3	4.7	59.1	61.0	2.6	1.4	-18.9	-23.0
F1	bluish green	90.6	3.4	72.6	73.6	-28.7	-28.3	0.7	-2.5
A1	orange	92.4	5.1	63.6	65.1	28.2	26.3	50.5	46.0
B2	purplish blue	91.7	3.9	44.6	46.2	-1.3	-2.1	-36.6	-40.1
C2	moderate red	89.4	5.1	53.6	54.9	38.9	37.8	15.4	10.6
D2	purple	86.3	3.5	34.3	35.5	14.0	14.0	-14.5	-17.7
E2	yellow green	94.3	3.9	73.1	74.4	-18.1	-18.9	52.7	49.1
F2	orange yellow	93.3	5.0	72.3	73.8	14.5	12.5	63.0	58.6
A3	blue	93.3	3.5	34.0	35.5	1.0	1.0	-39.7	-42.9
B3	green	93.0	3.5	53.7	55.0	-28.1	-28.8	27.7	24.5
C3	red	94.4	3.4	44.1	45.2	42.7	42.5	22.5	19.3
D3	yellow	94.5	4.9	80.6	82.3	3.2	1.0	75.1	71.0
E3	magenta	89.5	5.2	55.0	56.6	41.2	40.0	-11.7	-16.5
F3	cyan	92.3	3.4	54.3	55.7	-24.5	-24.6	-22.9	-26.0
A4	white	94.3	1.2	94.8	95.2	1.2	0.9	-3.5	-4.5
B4	neutral 8	80.7	2.6	81.9	83.1	-1.1	-1.7	-2.7	-5.0
C4	neutral 6.5	72.0	3.5	69.5	71.0	-1.8	-2.5	1.7	-1.5
D4	neutral 5	68.5	4.0	51.2	53.0	-2.1	-2.7	2.7	-0.7
E4	neutral 3.5	67.8	4.2	34.2	36.4	-1.9	-2.7	2.2	-1.3
F4	black	82.0	2.7	19.3	20.9	-0.8	-1.6	0.3	-1.8
A5	paper white	100.0	0.4	97.3	97.6	1.9	1.6	-6.4	-6.6
B5	Skin highlight L*=88	76.9	3.8	87.7	88.9	9.4	8.0	9.8	6.4
C5	Skin highlight L* =75	80.3	5.4	76.7	78.4	15.0	13.1	18.2	13.5
D5	Skin shadow L*=28	93.3	2.2	24.7	26.3	8.7	8.3	10.3	9.0
E5	Skin shadow L*=13	99.2	1.0	12.8	13.6	4.7	4.9	1.9	2.4
F5	Maximum Black	100.0	0.6	9.3	9.9	0.2	0.1	-1.9	-1.8

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	87.5	95.7	3.6
Worst 10% (3 lowest scoring patches)	69.4	92.7	5.5

20 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

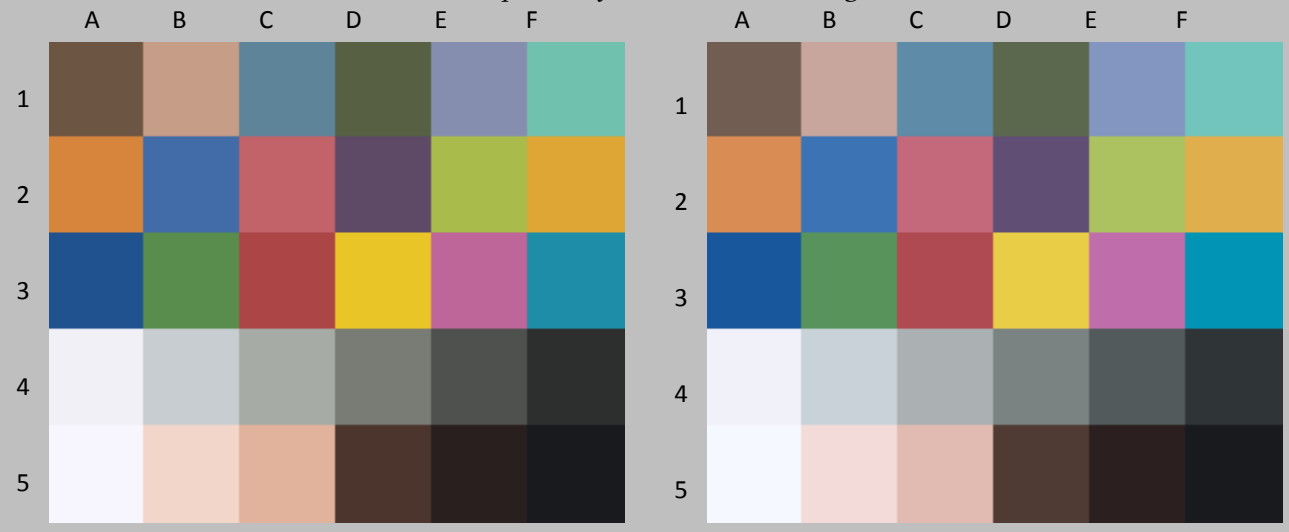
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	80.9	4.1	38.5	40.6	8.1	7.3	13.7	10.3
B1	Light Skin	70.6	7.5	68.0	70.4	13.4	11.6	18.2	11.3
C1	Blue sky	80.7	4.6	53.1	55.1	-9.5	-10.2	-16.2	-20.3
D1	Foliage	87.8	3.6	39.2	41.7	-8.2	-9.3	15.9	13.5
E1	blue flower	76.7	5.4	59.1	61.3	2.6	1.2	-18.9	-23.7
F1	bluish green	88.1	4.1	72.6	73.8	-28.7	-28.0	0.7	-3.2
A1	orange	89.0	7.1	63.6	65.4	28.2	25.9	50.5	44.1
B2	purplish blue	90.1	4.5	44.6	46.5	-1.3	-2.3	-36.6	-40.6
C2	moderate red	85.7	6.6	53.6	55.2	38.9	37.7	15.4	9.0
D2	purple	83.1	4.2	34.3	35.7	14.0	13.8	-14.5	-18.4
E2	yellow green	92.3	5.0	73.1	74.7	-18.1	-19.0	52.7	48.0
F2	orange yellow	90.9	6.6	72.3	74.1	14.5	12.1	63.0	57.1
A3	blue	91.7	4.2	34.0	35.7	1.0	0.7	-39.7	-43.5
B3	green	91.8	4.0	53.7	55.2	-28.1	-28.7	27.7	24.0
C3	red	92.1	4.5	44.1	45.3	42.7	42.5	22.5	18.1
D3	yellow	92.0	6.9	80.6	82.7	3.2	0.6	75.1	69.1
E3	magenta	86.8	6.4	55.0	56.8	41.2	39.8	-11.7	-17.7
F3	cyan	91.7	3.6	54.3	55.9	-24.5	-24.7	-22.9	-26.2
A4	white	96.2	0.9	94.8	95.1	1.2	0.9	-3.5	-4.3
B4	neutral 8	81.5	2.6	81.9	83.2	-1.1	-1.6	-2.7	-4.9
C4	neutral 6.5	70.1	3.7	69.5	71.2	-1.8	-2.5	1.7	-1.6
D4	neutral 5	65.7	4.4	51.2	53.4	-2.1	-2.7	2.7	-1.0
E4	neutral 3.5	65.9	4.6	34.2	37.0	-1.9	-2.8	2.2	-1.5
F4	black	79.6	3.0	19.3	21.1	-0.8	-1.8	0.3	-1.9
A5	paper white	97.9	0.7	97.3	97.5	1.9	1.4	-6.4	-5.9
B5	Skin highlight L*=88	71.3	4.6	87.7	89.1	9.4	8.0	9.8	5.6
C5	Skin highlight L* =75	74.0	6.9	76.7	78.7	15.0	13.1	18.2	11.9
D5	Skin shadow L*=28	93.5	2.4	24.7	26.7	8.7	8.2	10.3	9.0
E5	Skin shadow L*=13	96.0	1.1	12.8	13.5	4.7	5.0	1.9	2.7
F5	Maximum Black	100.0	0.2	9.3	9.2	0.2	0.0	-1.9	-1.9

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	85.1	94.3	4.3
Worst 10% (3 lowest scoring patches)	67.2	90.8	7.2

30 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

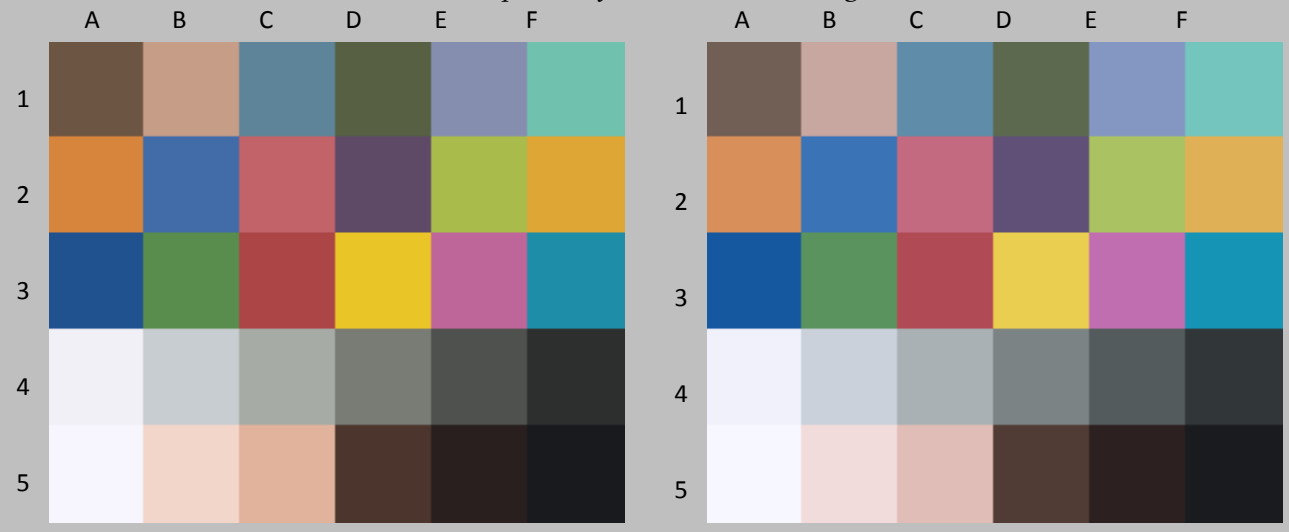
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	76.7	4.9	38.5	41.0	8.1	7.4	13.7	9.6
B1	Light Skin	62.5	9.4	68.0	70.9	13.4	11.7	18.2	9.4
C1	Blue sky	77.5	5.3	53.1	55.4	-9.5	-10.1	-16.2	-20.9
D1	Foliage	86.6	4.2	39.2	42.2	-8.2	-9.2	15.9	13.2
E1	blue flower	72.2	6.4	59.1	61.7	2.6	1.3	-18.9	-24.6
F1	bluish green	85.3	4.9	72.6	74.0	-28.7	-27.7	0.7	-4.0
A1	orange	84.9	9.5	63.6	65.9	28.2	25.6	50.5	41.7
B2	purplish blue	88.5	5.3	44.6	46.9	-1.3	-2.3	-36.6	-41.2
C2	moderate red	81.4	8.5	53.6	55.6	38.9	37.7	15.4	7.2
D2	purple	77.9	5.3	34.3	36.1	14.0	14.1	-14.5	-19.4
E2	yellow green	89.2	6.8	73.1	75.1	-18.1	-18.9	52.7	46.2
F2	orange yellow	87.7	8.8	72.3	74.6	14.5	11.7	63.0	55.0
A3	blue	89.8	5.0	34.0	36.1	1.0	0.8	-39.7	-44.3
B3	green	89.3	5.1	53.7	55.5	-28.1	-28.6	27.7	22.9
C3	red	89.5	5.8	44.1	45.6	42.7	42.6	22.5	16.9
D3	yellow	88.5	9.5	80.6	83.3	3.2	0.1	75.1	66.5
E3	magenta	83.6	7.8	55.0	57.3	41.2	39.9	-11.7	-19.1
F3	cyan	90.4	4.2	54.3	56.2	-24.5	-24.6	-22.9	-26.6
A4	white	94.5	1.2	94.8	95.4	1.2	0.9	-3.5	-4.5
B4	neutral 8	77.8	3.0	81.9	83.5	-1.1	-1.5	-2.7	-5.3
C4	neutral 6.5	64.8	4.4	69.5	71.6	-1.8	-2.4	1.7	-2.2
D4	neutral 5	61.9	4.9	51.2	53.9	-2.1	-2.6	2.7	-1.4
E4	neutral 3.5	63.5	5.2	34.2	37.5	-1.9	-2.7	2.2	-1.7
F4	black	76.1	3.7	19.3	21.7	-0.8	-1.9	0.3	-2.2
A5	paper white	94.3	1.1	97.3	97.6	1.9	1.4	-6.4	-5.6
B5	Skin highlight L*=88	62.1	5.9	87.7	89.4	9.4	8.1	9.8	4.3
C5	Skin highlight L* =75	66.5	8.8	76.7	79.2	15.0	13.1	18.2	10.0
D5	Skin shadow L*=28	92.0	3.0	24.7	27.2	8.7	8.4	10.3	8.8
E5	Skin shadow L*=13	93.6	1.5	12.8	13.8	4.7	5.0	1.9	3.0
F5	Maximum Black	100.0	0.3	9.3	9.5	0.2	0.0	-1.9	-1.8

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	81.6	93.3	5.3
Worst 10% (3 lowest scoring patches)	62.1	88.7	9.5

40 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

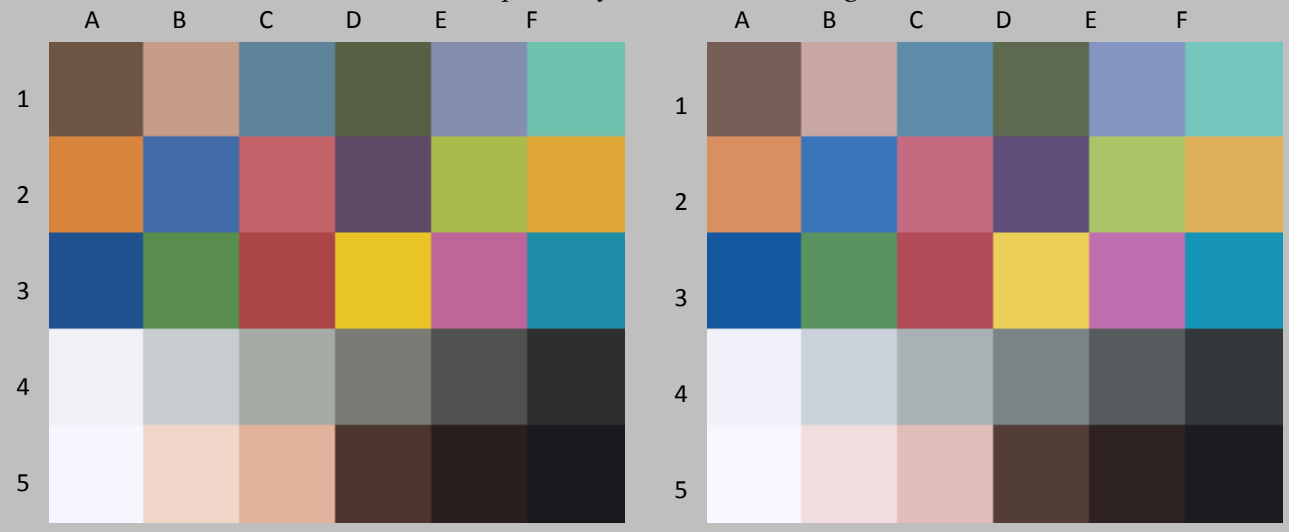
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	72.5	5.7	38.5	41.4	8.1	7.4	13.7	8.9
B1	Light Skin	55.9	10.9	68.0	71.2	13.4	11.8	18.2	7.9
C1	Blue sky	75.7	5.7	53.1	55.7	-9.5	-10.2	-16.2	-21.2
D1	Foliage	85.2	4.6	39.2	42.6	-8.2	-9.1	15.9	12.9
E1	blue flower	68.7	7.1	59.1	62.0	2.6	1.4	-18.9	-25.3
F1	bluish green	82.7	5.7	72.6	74.2	-28.7	-27.4	0.7	-4.7
A1	orange	81.4	11.5	63.6	66.2	28.2	25.3	50.5	39.7
B2	purplish blue	87.5	5.7	44.6	47.2	-1.3	-2.3	-36.6	-41.6
C2	moderate red	77.2	10.3	53.6	56.0	38.9	37.7	15.4	5.4
D2	purple	73.7	6.2	34.3	36.4	14.0	14.1	-14.5	-20.3
E2	yellow green	86.7	8.2	73.1	75.4	-18.1	-18.8	52.7	44.8
F2	orange yellow	83.8	11.3	72.3	75.0	14.5	11.4	63.0	52.5
A3	blue	88.2	5.7	34.0	36.5	1.0	1.1	-39.7	-44.9
B3	green	86.4	6.3	53.7	55.9	-28.1	-28.4	27.7	21.8
C3	red	87.2	6.9	44.1	45.9	42.7	42.7	22.5	15.8
D3	yellow	85.3	12.0	80.6	83.7	3.2	-0.2	75.1	64.1
E3	magenta	81.6	8.8	55.0	57.6	41.2	39.7	-11.7	-19.9
F3	cyan	89.3	4.5	54.3	56.3	-24.5	-24.3	-22.9	-27.0
A4	white	93.8	1.3	94.8	95.4	1.2	0.9	-3.5	-4.5
B4	neutral 8	75.2	3.3	81.9	83.5	-1.1	-1.4	-2.7	-5.6
C4	neutral 6.5	60.4	4.9	69.5	71.8	-1.8	-2.3	1.7	-2.6
D4	neutral 5	58.9	5.3	51.2	54.2	-2.1	-2.4	2.7	-1.7
E4	neutral 3.5	61.8	5.5	34.2	37.9	-1.9	-2.5	2.2	-1.9
F4	black	73.9	4.2	19.3	22.3	-0.8	-1.9	0.3	-2.5
A5	paper white	92.2	1.3	97.3	97.6	1.9	1.3	-6.4	-5.4
B5	Skin highlight L*=88	53.2	7.1	87.7	89.5	9.4	8.3	9.8	3.0
C5	Skin highlight L* =75	59.7	10.4	76.7	79.5	15.0	13.0	18.2	8.4
D5	Skin shadow L*=28	89.9	3.4	24.7	27.5	8.7	8.4	10.3	8.5
E5	Skin shadow L*=13	92.4	1.8	12.8	14.1	4.7	5.1	1.9	3.1
F5	Maximum Black	100.0	0.7	9.3	10.0	0.2	0.0	-1.9	-1.7

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	78.7	92.6	6.2
Worst 10% (3 lowest scoring patches)	56.0	87.3	11.6

50 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

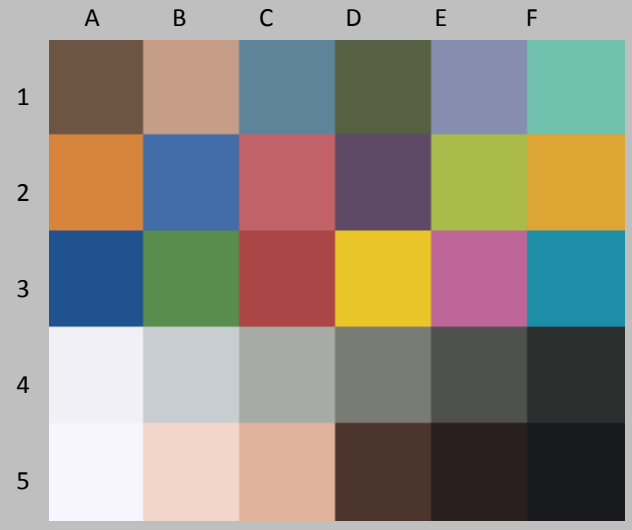
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	70.9	6.1	38.5	41.8	8.1	7.6	13.7	8.6
B1	Light Skin	50.0	12.3	68.0	71.5	13.4	12.0	18.2	6.5
C1	Blue sky	75.0	5.9	53.1	55.9	-9.5	-10.0	-16.2	-21.4
D1	Foliage	86.0	4.8	39.2	43.0	-8.2	-8.9	15.9	13.0
E1	blue flower	67.0	7.5	59.1	62.2	2.6	1.7	-18.9	-25.7
F1	bluish green	81.3	6.1	72.6	74.3	-28.7	-27.2	0.7	-5.0
A1	orange	77.5	13.8	63.6	66.6	28.2	25.2	50.5	37.3
B2	purplish blue	86.6	6.1	44.6	47.4	-1.3	-2.3	-36.6	-41.9
C2	moderate red	73.1	12.0	53.6	56.2	38.9	37.8	15.4	3.7
D2	purple	70.3	6.9	34.3	36.6	14.0	14.3	-14.5	-21.0
E2	yellow green	83.8	9.9	73.1	75.7	-18.1	-18.6	52.7	43.2
F2	orange yellow	80.2	13.6	72.3	75.4	14.5	11.3	63.0	50.1
A3	blue	87.2	6.2	34.0	36.7	1.0	1.1	-39.7	-45.3
B3	green	84.6	7.0	53.7	56.2	-28.1	-28.2	27.7	21.1
C3	red	84.7	8.1	44.1	46.2	42.7	42.8	22.5	14.6
D3	yellow	81.0	15.2	80.6	84.1	3.2	-0.3	75.1	60.8
E3	magenta	79.5	9.7	55.0	57.8	41.2	39.7	-11.7	-20.8
F3	cyan	89.5	4.5	54.3	56.4	-24.5	-24.2	-22.9	-26.9
A4	white	96.8	1.0	94.8	95.4	1.2	0.9	-3.5	-4.2
B4	neutral 8	75.2	3.4	81.9	83.7	-1.1	-1.4	-2.7	-5.6
C4	neutral 6.5	59.1	5.0	69.5	72.0	-1.8	-2.1	1.7	-2.7
D4	neutral 5	58.2	5.6	51.2	54.5	-2.1	-2.3	2.7	-1.8
E4	neutral 3.5	63.7	5.7	34.2	38.3	-1.9	-2.4	2.2	-1.8
F4	black	74.6	4.5	19.3	22.7	-0.8	-1.8	0.3	-2.4
A5	paper white	84.5	2.0	97.3	97.5	1.9	1.1	-6.4	-4.6
B5	Skin highlight L*=88	45.5	8.1	87.7	89.6	9.4	8.4	9.8	1.9
C5	Skin highlight L* =75	53.6	11.8	76.7	79.8	15.0	13.3	18.2	6.9
D5	Skin shadow L*=28	89.3	3.9	24.7	28.1	8.7	8.6	10.3	8.4
E5	Skin shadow L*=13	89.5	2.3	12.8	14.5	4.7	5.1	1.9	3.4
F5	Maximum Black	99.6	1.0	9.3	10.2	0.2	-0.2	-1.9	-1.5

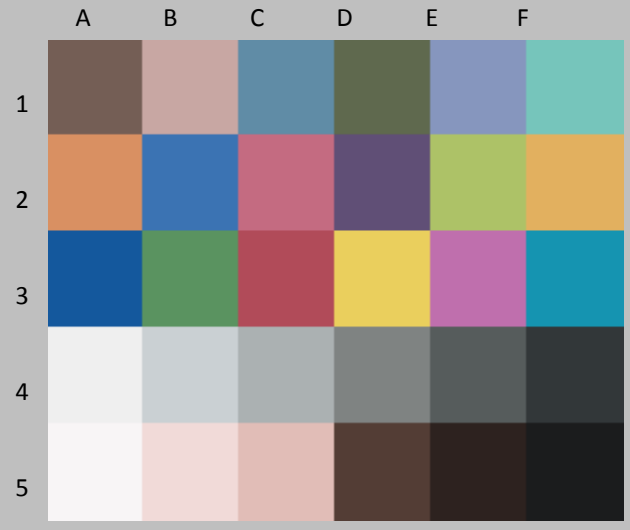
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	76.6	91.8	7.0
Worst 10% (3 lowest scoring patches)	49.7	86.2	14.2

60 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure



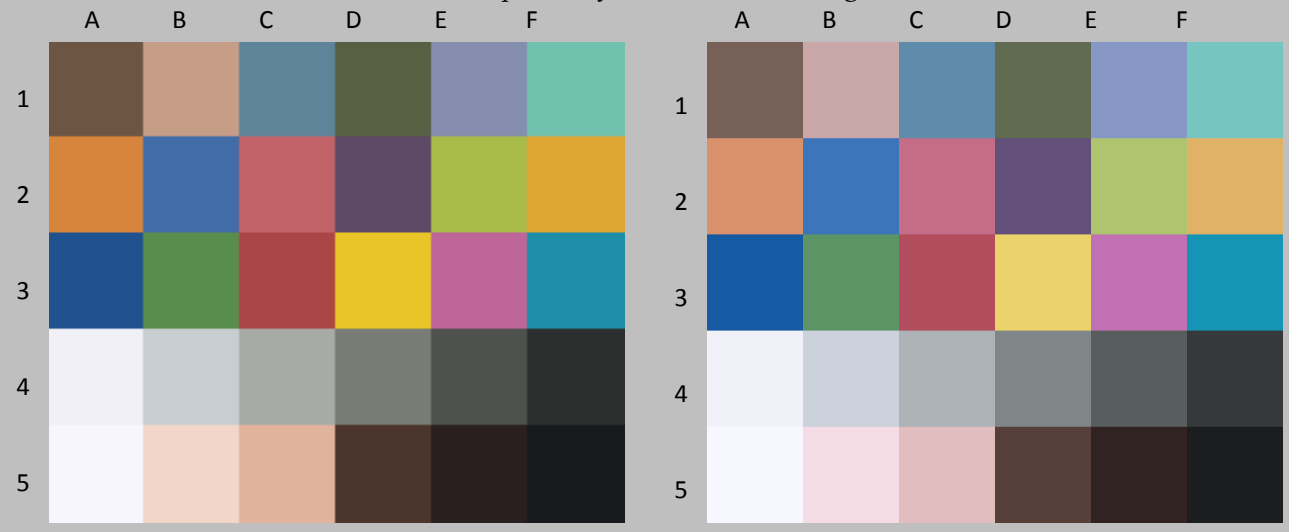
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	73.4	5.9	38.5	42.0	8.1	7.8	13.7	9.0
B1	Light Skin	53.2	11.6	68.0	71.4	13.4	12.3	18.2	7.2
C1	Blue sky	84.8	4.3	53.1	55.7	-9.5	-10.3	-16.2	-19.5
D1	Foliage	91.5	4.4	39.2	43.2	-8.2	-8.4	15.9	13.9
E1	blue flower	78.3	5.5	59.1	62.0	2.6	1.1	-18.9	-23.3
F1	bluish green	87.5	4.3	72.6	74.0	-28.7	-27.2	0.7	-3.1
A1	orange	75.0	15.2	63.6	66.5	28.2	25.3	50.5	35.8
B2	purplish blue	91.2	4.6	44.6	47.2	-1.3	-3.1	-36.6	-39.9
C2	moderate red	72.8	12.1	53.6	56.2	38.9	37.6	15.4	3.6
D2	purple	74.0	6.2	34.3	36.6	14.0	14.0	-14.5	-20.2
E2	yellow green	83.1	10.2	73.1	75.4	-18.1	-17.9	52.7	42.8
F2	orange yellow	77.7	15.2	72.3	75.2	14.5	11.7	63.0	48.3
A3	blue	90.4	5.1	34.0	36.7	1.0	0.3	-39.7	-44.0
B3	green	84.7	6.9	53.7	56.0	-28.1	-27.6	27.7	21.1
C3	red	84.1	8.4	44.1	46.2	42.7	42.6	22.5	14.3
D3	yellow	78.9	16.7	80.6	83.9	3.2	0.3	75.1	59.0
E3	magenta	82.8	8.3	55.0	57.8	41.2	39.3	-11.7	-19.3
F3	cyan	95.0	2.8	54.3	56.1	-24.5	-24.7	-22.9	-25.0
A4	white	69.6	3.4	94.8	94.7	1.2	0.4	-3.5	-0.2
B4	neutral 8	98.4	1.4	81.9	83.1	-1.1	-1.6	-2.7	-2.2
C4	neutral 6.5	81.0	3.2	69.5	71.8	-1.8	-2.1	1.7	-0.6
D4	neutral 5	74.3	4.4	51.2	54.5	-2.1	-2.2	2.7	-0.2
E4	neutral 3.5	76.1	5.1	34.2	38.5	-1.9	-2.2	2.2	-0.6
F4	black	81.7	4.3	19.3	22.9	-0.8	-1.7	0.3	-1.7
A5	paper white	37.3	6.5	97.3	96.8	1.9	0.6	-6.4	-0.1
B5	Skin highlight L*=88	60.8	6.0	87.7	89.1	9.4	8.4	9.8	4.0
C5	Skin highlight L* =75	56.9	11.0	76.7	79.4	15.0	13.4	18.2	7.7
D5	Skin shadow L*=28	92.3	4.0	24.7	28.3	8.7	8.8	10.3	8.8
E5	Skin shadow L*=13	85.7	2.5	12.8	14.5	4.7	5.3	1.9	3.7
F5	Maximum Black	99.3	1.0	9.3	10.2	0.2	-0.2	-1.9	-1.5

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	79.1	90.9	6.7
Worst 10% (3 lowest scoring patches)	49.1	84.6	15.7

70 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

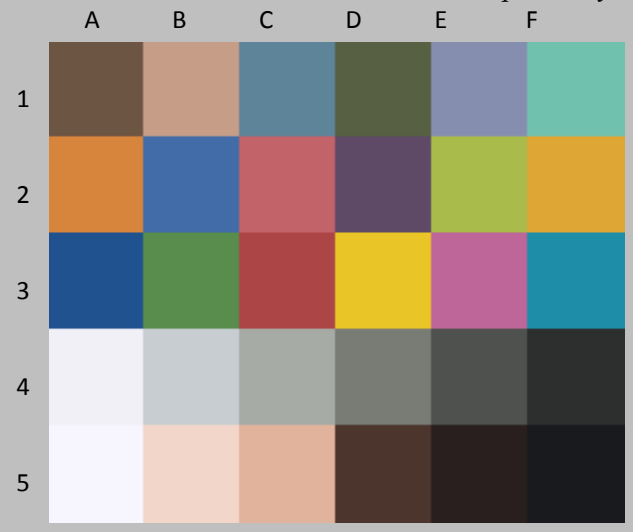
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	65.0	7.3	38.5	42.6	8.1	8.1	13.7	7.6
B1	Light Skin	37.5	15.1	68.0	72.0	13.4	12.7	18.2	3.6
C1	Blue sky	73.5	6.3	53.1	56.2	-9.5	-9.5	-16.2	-21.7
D1	Foliage	87.1	5.5	39.2	44.0	-8.2	-8.1	15.9	13.1
E1	blue flower	65.2	8.0	59.1	62.6	2.6	2.1	-18.9	-26.1
F1	bluish green	76.6	7.5	72.6	74.5	-28.7	-26.4	0.7	-6.2
A1	orange	68.8	18.9	63.6	67.1	28.2	25.1	50.5	32.2
B2	purplish blue	86.3	6.3	44.6	47.7	-1.3	-2.2	-36.6	-42.1
C2	moderate red	65.6	15.2	53.6	56.7	38.9	37.9	15.4	0.5
D2	purple	64.4	8.2	34.3	37.1	14.0	14.6	-14.5	-22.1
E2	yellow green	77.4	13.4	73.1	76.0	-18.1	-18.0	52.7	39.6
F2	orange yellow	71.7	19.1	72.3	75.8	14.5	11.4	63.0	44.5
A3	blue	86.1	6.8	34.0	37.1	1.0	1.3	-39.7	-45.8
B3	green	80.1	8.8	53.7	56.6	-28.1	-27.4	27.7	19.3
C3	red	79.6	10.6	44.1	46.7	42.7	42.8	22.5	12.1
D3	yellow	72.6	21.5	80.6	84.5	3.2	-0.2	75.1	54.3
E3	magenta	76.3	11.1	55.0	58.2	41.2	39.9	-11.7	-22.2
F3	cyan	89.0	4.8	54.3	56.6	-24.5	-23.8	-22.9	-27.0
A4	white	97.1	0.9	94.8	95.2	1.2	1.1	-3.5	-4.3
B4	neutral 8	71.9	3.7	81.9	83.8	-1.1	-0.8	-2.7	-5.9
C4	neutral 6.5	52.4	5.8	69.5	72.4	-1.8	-1.5	1.7	-3.4
D4	neutral 5	56.7	6.1	51.2	55.1	-2.1	-1.7	2.7	-1.9
E4	neutral 3.5	67.1	6.2	34.2	39.3	-1.9	-1.8	2.2	-1.5
F4	black	79.7	4.9	19.3	23.6	-0.8	-1.4	0.3	-2.0
A5	paper white	74.7	2.9	97.3	97.3	1.9	1.0	-6.4	-3.7
B5	Skin highlight L*=88	27.2	10.6	87.7	89.7	9.4	9.1	9.8	-0.6
C5	Skin highlight L* =75	39.9	15.1	76.7	80.1	15.0	13.9	18.2	3.6
D5	Skin shadow L*=28	88.9	4.8	24.7	29.0	8.7	9.2	10.3	8.4
E5	Skin shadow L*=13	84.1	3.1	12.8	15.1	4.7	5.5	1.9	3.7
F5	Maximum Black	100.0	1.4	9.3	10.6	0.2	-0.2	-1.9	-1.6

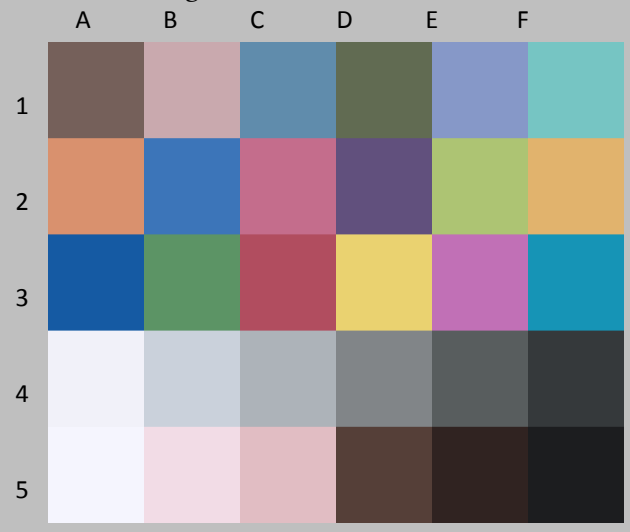
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	72.1	89.9	8.7
Worst 10% (3 lowest scoring patches)	34.8	83.4	19.8

80 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure



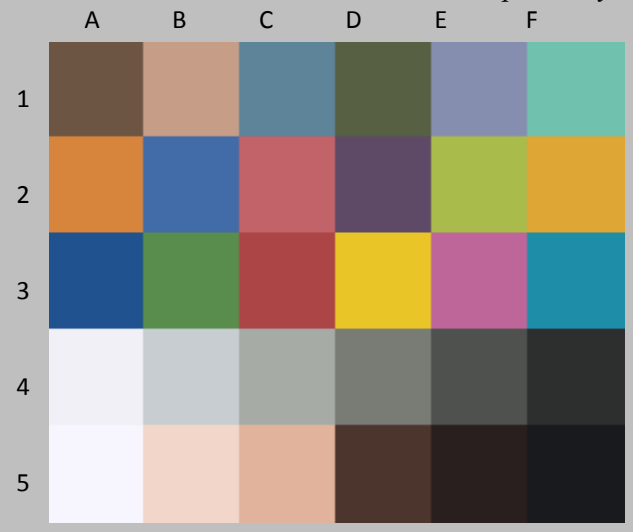
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	62.4	7.8	38.5	42.8	8.1	8.3	13.7	7.2
B1	Light Skin	32.1	16.4	68.0	72.2	13.4	13.0	18.2	2.4
C1	Blue sky	70.7	6.8	53.1	56.3	-9.5	-9.3	-16.2	-22.2
D1	Foliage	86.7	5.6	39.2	44.1	-8.2	-7.9	15.9	13.1
E1	blue flower	62.3	8.5	59.1	62.6	2.6	2.5	-18.9	-26.7
F1	bluish green	73.9	8.2	72.6	74.5	-28.7	-26.2	0.7	-6.9
A1	orange	65.5	20.7	63.6	67.2	28.2	25.2	50.5	30.3
B2	purplish blue	85.5	6.6	44.6	47.7	-1.3	-2.0	-36.6	-42.4
C2	moderate red	62.1	16.6	53.6	56.8	38.9	38.1	15.4	-1.0
D2	purple	61.0	8.8	34.3	37.2	14.0	14.8	-14.5	-22.8
E2	yellow green	74.3	15.1	73.1	76.1	-18.1	-17.8	52.7	37.9
F2	orange yellow	68.4	21.2	72.3	75.9	14.5	11.5	63.0	42.3
A3	blue	84.9	7.2	34.0	37.1	1.0	1.4	-39.7	-46.2
B3	green	78.2	9.5	53.7	56.6	-28.1	-27.2	27.7	18.6
C3	red	77.4	11.7	44.1	46.7	42.7	42.9	22.5	11.0
D3	yellow	68.7	24.3	80.6	84.6	3.2	0.0	75.1	51.3
E3	magenta	74.6	11.9	55.0	58.3	41.2	40.0	-11.7	-23.0
F3	cyan	88.1	5.0	54.3	56.6	-24.5	-23.6	-22.9	-27.3
A4	white	96.4	0.9	94.8	95.1	1.2	1.1	-3.5	-4.3
B4	neutral 8	67.8	4.0	81.9	83.7	-1.1	-0.6	-2.7	-6.2
C4	neutral 6.5	45.9	6.3	69.5	72.4	-1.8	-1.3	1.7	-4.0
D4	neutral 5	53.3	6.4	51.2	55.2	-2.1	-1.5	2.7	-2.2
E4	neutral 3.5	67.4	6.3	34.2	39.4	-1.9	-1.7	2.2	-1.4
F4	black	80.8	5.0	19.3	23.7	-0.8	-1.3	0.3	-2.0
A5	paper white	73.4	3.1	97.3	97.0	1.9	1.0	-6.4	-3.6
B5	Skin highlight L*=88	17.4	11.9	87.7	89.6	9.4	9.4	9.8	-1.9
C5	Skin highlight L* =75	32.8	16.7	76.7	80.0	15.0	14.3	18.2	1.9
D5	Skin shadow L*=28	87.4	5.0	24.7	29.1	8.7	9.3	10.3	8.2
E5	Skin shadow L*=13	83.2	3.1	12.8	15.1	4.7	5.7	1.9	3.8
F5	Maximum Black	99.7	1.3	9.3	10.5	0.2	-0.2	-1.9	-1.6

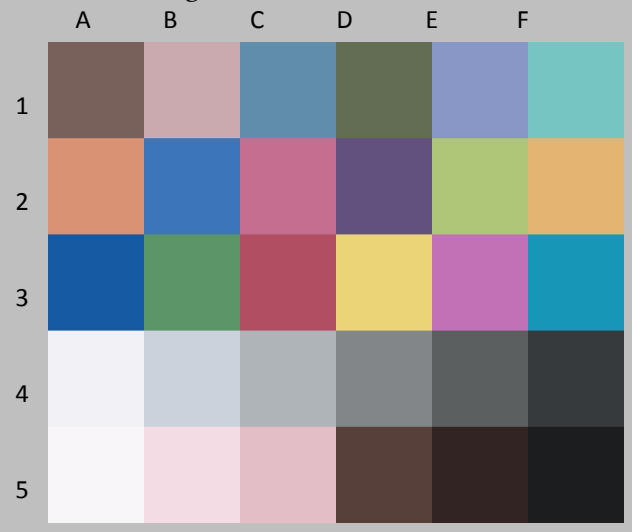
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	69.4	89.1	9.4
Worst 10% (3 lowest scoring patches)	27.5	81.8	22.1

90 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure



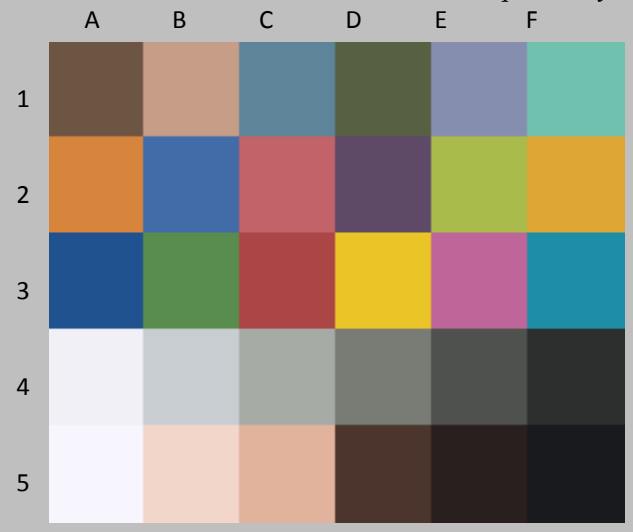
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	61.0	8.3	38.5	43.3	8.1	8.6	13.7	7.0
B1	Light Skin	29.5	17.0	68.0	72.5	13.4	13.2	18.2	1.8
C1	Blue sky	72.2	6.7	53.1	56.5	-9.5	-9.3	-16.2	-21.9
D1	Foliage	88.4	6.1	39.2	44.8	-8.2	-7.7	15.9	13.4
E1	blue flower	63.4	8.4	59.1	62.8	2.6	2.5	-18.9	-26.4
F1	bluish green	73.8	8.3	72.6	74.7	-28.7	-25.9	0.7	-6.8
A1	orange	62.2	22.7	63.6	67.6	28.2	25.3	50.5	28.3
B2	purplish blue	86.0	6.6	44.6	47.9	-1.3	-2.2	-36.6	-42.2
C2	moderate red	59.7	17.7	53.6	57.3	38.9	38.3	15.4	-2.0
D2	purple	59.6	9.2	34.3	37.5	14.0	14.9	-14.5	-23.1
E2	yellow green	71.3	16.8	73.1	76.5	-18.1	-17.4	52.7	36.2
F2	orange yellow	65.4	23.2	72.3	76.3	14.5	11.6	63.0	40.3
A3	blue	84.9	7.3	34.0	37.3	1.0	1.2	-39.7	-46.2
B3	green	76.7	10.2	53.7	57.0	-28.1	-26.8	27.7	18.1
C3	red	75.4	12.7	44.1	47.2	42.7	43.1	22.5	10.1
D3	yellow	64.1	27.9	80.6	85.0	3.2	0.2	75.1	47.8
E3	magenta	74.7	11.9	55.0	58.7	41.2	39.9	-11.7	-22.9
F3	cyan	89.5	4.8	54.3	56.9	-24.5	-23.6	-22.9	-26.8
A4	white	90.6	1.5	94.8	95.2	1.2	0.8	-3.5	-2.2
B4	neutral 8	81.2	3.1	81.9	83.9	-1.1	-0.7	-2.7	-5.0
C4	neutral 6.5	53.1	5.9	69.5	72.8	-1.8	-1.2	1.7	-3.3
D4	neutral 5	56.8	6.5	51.2	55.7	-2.1	-1.3	2.7	-1.8
E4	neutral 3.5	70.4	6.8	34.2	40.1	-1.9	-1.4	2.2	-1.1
F4	black	85.6	5.4	19.3	24.4	-0.8	-1.0	0.3	-1.5
A5	paper white	51.4	5.1	97.3	97.1	1.9	0.6	-6.4	-1.5
B5	Skin highlight L*=88	21.2	11.4	87.7	89.9	9.4	9.3	9.8	-1.4
C5	Skin highlight L* =75	30.9	17.2	76.7	80.4	15.0	14.6	18.2	1.4
D5	Skin shadow L*=28	87.5	5.6	24.7	29.8	8.7	9.8	10.3	8.4
E5	Skin shadow L*=13	76.2	3.9	12.8	15.6	4.7	6.1	1.9	4.3
F5	Maximum Black	99.9	1.5	9.3	10.8	0.2	-0.1	-1.9	-1.5

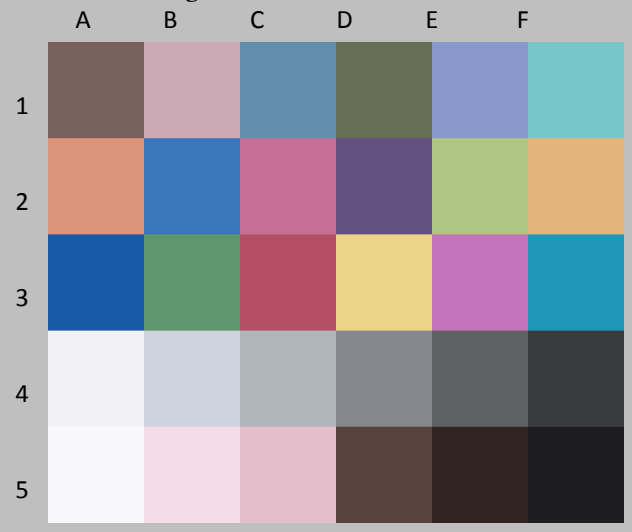
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	68.8	88.2	10.0
Worst 10% (3 lowest scoring patches)	27.2	81.1	24.6

100 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure



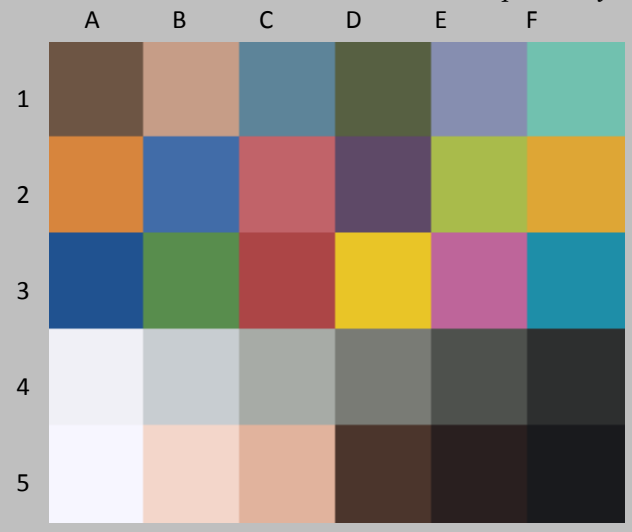
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	53.6	9.5	38.5	43.9	8.1	8.9	13.7	5.9
B1	Light Skin	16.9	19.9	68.0	73.0	13.4	13.9	18.2	-1.1
C1	Blue sky	68.8	7.5	53.1	57.0	-9.5	-8.7	-16.2	-22.5
D1	Foliage	85.8	6.9	39.2	45.4	-8.2	-7.3	15.9	13.0
E1	blue flower	57.5	9.6	59.1	63.2	2.6	3.2	-18.9	-27.6
F1	bluish green	67.0	10.3	72.6	75.0	-28.7	-25.2	0.7	-8.7
A1	orange	54.6	27.1	63.6	68.1	28.2	25.5	50.5	23.9
B2	purplish blue	84.4	7.2	44.6	48.3	-1.3	-1.8	-36.6	-42.8
C2	moderate red	53.1	20.5	53.6	57.7	38.9	38.6	15.4	-4.7
D2	purple	53.1	10.6	34.3	38.0	14.0	15.2	-14.5	-24.4
E2	yellow green	64.0	20.9	73.1	76.9	-18.1	-17.0	52.7	32.2
F2	orange yellow	57.4	28.4	72.3	76.9	14.5	11.8	63.0	35.0
A3	blue	83.0	8.2	34.0	37.8	1.0	1.6	-39.7	-47.0
B3	green	71.7	12.3	53.7	57.5	-28.1	-26.3	27.7	16.1
C3	red	70.4	15.2	44.1	47.6	42.7	43.3	22.5	7.7
D3	yellow	55.6	34.2	80.6	85.6	3.2	0.5	75.1	41.4
E3	magenta	71.8	13.2	55.0	59.1	41.2	40.3	-11.7	-24.2
F3	cyan	87.1	5.6	54.3	57.1	-24.5	-23.2	-22.9	-27.5
A4	white	93.4	1.3	94.8	95.3	1.2	0.8	-3.5	-2.4
B4	neutral 8	73.6	3.8	81.9	84.2	-1.1	-0.5	-2.7	-5.6
C4	neutral 6.5	40.7	7.1	69.5	73.2	-1.8	-0.8	1.7	-4.4
D4	neutral 5	47.9	7.5	51.2	56.3	-2.1	-0.9	2.7	-2.6
E4	neutral 3.5	67.2	7.6	34.2	40.8	-1.9	-1.1	2.2	-1.3
F4	black	87.4	6.0	19.3	25.1	-0.8	-0.8	0.3	-1.4
A5	paper white	53.0	5.0	97.3	97.2	1.9	0.6	-6.4	-1.6
B5	Skin highlight L*=88	6.9	13.3	87.7	90.2	9.4	9.7	9.8	-3.3
C5	Skin highlight L* =75	19.7	19.9	76.7	80.8	15.0	15.1	18.2	-1.2
D5	Skin shadow L*=28	84.7	6.4	24.7	30.5	8.7	10.1	10.3	8.2
E5	Skin shadow L*=13	72.2	4.7	12.8	16.2	4.7	6.3	1.9	4.6
F5	Maximum Black	97.3	1.8	9.3	11.0	0.2	-0.2	-1.9	-1.3

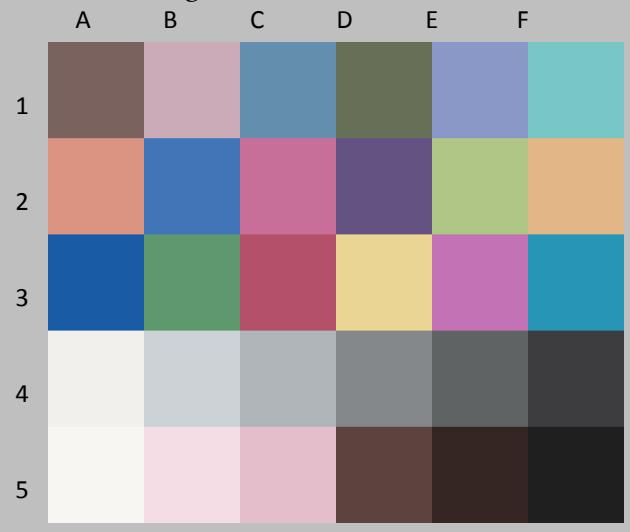
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	63.3	86.8	11.7
Worst 10% (3 lowest scoring patches)	14.5	79.5	29.9

120 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure



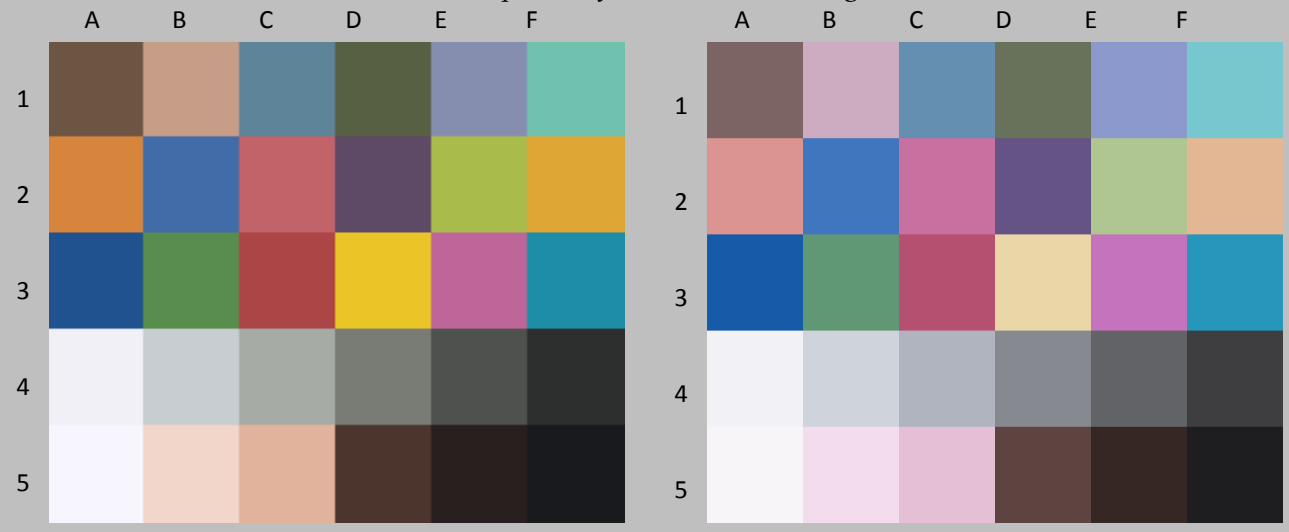
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	51.9	10.0	38.5	44.2	8.1	9.2	13.7	5.6
B1	Light Skin	14.4	20.5	68.0	73.2	13.4	14.3	18.2	-1.6
C1	Blue sky	75.2	6.4	53.1	56.9	-9.5	-8.8	-16.2	-21.3
D1	Foliage	87.1	7.3	39.2	46.0	-8.2	-6.9	15.9	13.4
E1	blue flower	66.6	8.1	59.1	63.3	2.6	3.1	-18.9	-25.8
F1	bluish green	68.3	9.9	72.6	74.9	-28.7	-24.9	0.7	-8.1
A1	orange	48.9	30.4	63.6	68.4	28.2	26.0	50.5	20.5
B2	purplish blue	88.8	6.0	44.6	48.4	-1.3	-2.4	-36.6	-41.1
C2	moderate red	50.8	21.5	53.6	58.0	38.9	38.8	15.4	-5.7
D2	purple	54.6	10.5	34.3	38.3	14.0	15.1	-14.5	-24.1
E2	yellow green	58.3	24.1	73.1	77.0	-18.1	-16.1	52.7	29.0
F2	orange yellow	50.9	32.6	72.3	77.1	14.5	12.5	63.0	30.8
A3	blue	86.0	7.2	34.0	37.9	1.0	1.0	-39.7	-45.8
B3	green	68.9	13.4	53.7	57.7	-28.1	-25.6	27.7	15.2
C3	red	68.0	16.4	44.1	48.0	42.7	43.4	22.5	6.5
D3	yellow	47.7	40.1	80.6	85.7	3.2	1.5	75.1	35.4
E3	magenta	75.9	11.7	55.0	59.3	41.2	39.8	-11.7	-22.4
F3	cyan	92.5	4.1	54.3	57.1	-24.5	-23.4	-22.9	-25.7
A4	white	48.7	5.4	94.8	94.8	1.2	0.3	-3.5	1.8
B4	neutral 8	100.0	2.1	81.9	83.9	-1.1	-0.7	-2.7	-2.6
C4	neutral 6.5	56.3	5.9	69.5	73.2	-1.8	-0.7	1.7	-2.9
D4	neutral 5	57.8	7.0	51.2	56.5	-2.1	-0.6	2.7	-1.6
E4	neutral 3.5	74.3	7.8	34.2	41.4	-1.9	-0.8	2.2	-0.6
F4	black	95.2	6.7	19.3	25.9	-0.8	-0.4	0.3	-0.5
A5	paper white	9.8	9.1	97.3	96.8	1.9	0.1	-6.4	2.4
B5	Skin highlight L*=88	21.5	11.4	87.7	90.0	9.4	9.3	9.8	-1.4
C5	Skin highlight L* =75	18.6	20.1	76.7	80.8	15.0	15.3	18.2	-1.5
D5	Skin shadow L*=28	82.7	7.2	24.7	31.3	8.7	10.6	10.3	8.2
E5	Skin shadow L*=13	65.3	5.5	12.8	16.8	4.7	6.8	1.9	5.1
F5	Maximum Black	95.0	2.6	9.3	11.8	0.2	-0.2	-1.9	-1.0

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	62.7	85.5	12.4
Worst 10% (3 lowest scoring patches)	14.3	77.7	34.4

140 Megalux hours

Epson Stylus Photo R3000, ConeColorPro® ink (for Epson R3000 printer), Epson Ultra Premium Photo Paper Glossy, no additional coating



Original Print Colors before light exposure

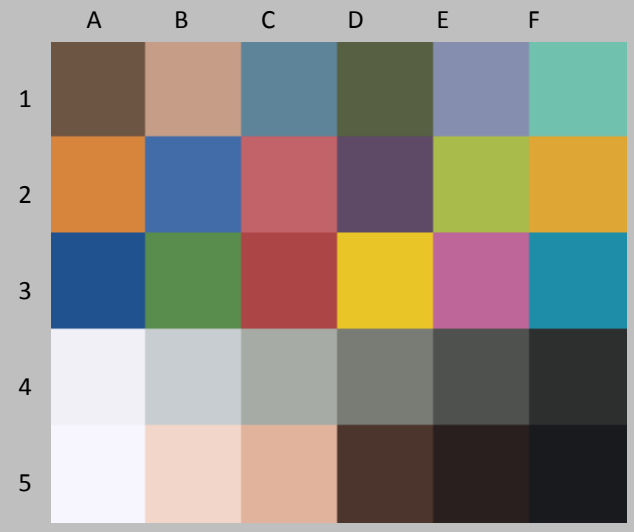
Colors After light exposure

				L*		a*		b*	
Patch #	Description	I* Color	ΔE	Before	After	Before	After	Before	After
A1	Dark Skin	39.1	12.0	38.5	44.9	8.1	9.6	13.7	3.7
B1	Light Skin	(4.9)	24.9	68.0	73.8	13.4	15.3	18.2	-5.9
C1	Blue sky	64.0	8.5	53.1	57.4	-9.5	-7.8	-16.2	-23.2
D1	Foliage	80.2	8.2	39.2	46.4	-8.2	-6.5	15.9	12.2
E1	blue flower	52.9	10.6	59.1	63.7	2.6	4.3	-18.9	-28.3
F1	bluish green	54.9	13.7	72.6	75.2	-28.7	-23.7	0.7	-11.8
A1	orange	38.2	36.6	63.6	68.8	28.2	26.6	50.5	14.3
B2	purplish blue	83.5	7.7	44.6	48.6	-1.3	-1.2	-36.6	-43.1
C2	moderate red	40.5	25.8	53.6	58.4	38.9	39.6	15.4	-10.0
D2	purple	42.5	12.9	34.3	38.7	14.0	16.0	-14.5	-26.4
E2	yellow green	47.0	30.3	73.1	77.4	-18.1	-15.5	52.7	22.8
F2	orange yellow	39.8	39.8	72.3	77.6	14.5	13.1	63.0	23.6
A3	blue	80.8	9.1	34.0	38.2	1.0	2.2	-39.7	-47.8
B3	green	61.5	16.3	53.7	58.1	-28.1	-25.1	27.7	12.3
C3	red	60.8	19.8	44.1	48.3	42.7	43.7	22.5	3.1
D3	yellow	35.8	49.1	80.6	86.2	3.2	2.3	75.1	26.3
E3	magenta	69.4	14.4	55.0	59.7	41.2	40.7	-11.7	-25.3
F3	cyan	85.4	6.2	54.3	57.3	-24.5	-22.3	-22.9	-27.9
A4	white	85.4	1.9	94.8	95.1	1.2	0.7	-3.5	-1.7
B4	neutral 8	75.4	3.7	81.9	84.3	-1.1	-0.2	-2.7	-5.4
C4	neutral 6.5	23.3	8.8	69.5	73.5	-1.8	0.0	1.7	-5.9
D4	neutral 5	35.7	8.7	51.2	56.9	-2.1	0.0	2.7	-3.6
E4	neutral 3.5	62.4	8.7	34.2	41.9	-1.9	-0.4	2.2	-1.6
F4	black	90.4	7.3	19.3	26.4	-0.8	-0.1	0.3	-0.9
A5	paper white	44.5	5.8	97.3	96.9	1.9	0.5	-6.4	-0.8
B5	Skin highlight L*=88	(4.3)	14.9	87.7	90.3	9.4	9.8	9.8	-4.9
C5	Skin highlight L* =75	(1.9)	25.0	76.7	81.2	15.0	16.2	18.2	-6.3
D5	Skin shadow L*=28	76.5	8.0	24.7	31.8	8.7	11.0	10.3	7.4
E5	Skin shadow L*=13	60.5	6.1	12.8	17.2	4.7	7.2	1.9	5.3
F5	Maximum Black	97.1	2.4	9.3	11.5	0.2	-0.1	-1.9	-1.2

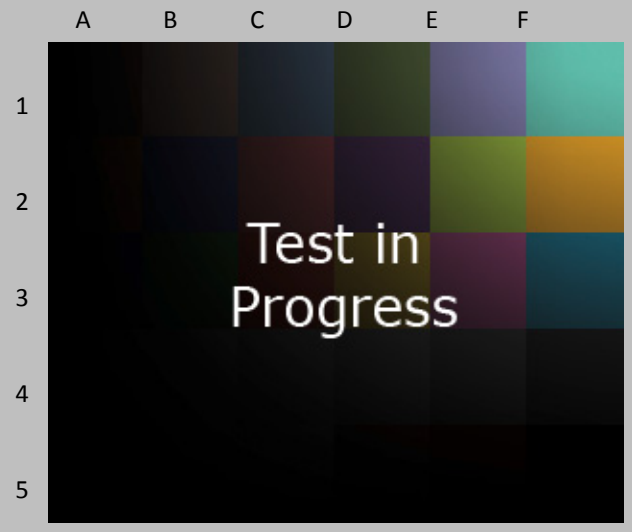
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	53.9	84.4	14.9
Worst 10% (3 lowest scoring patches)	(3.7)	76.3	41.8

160 Megalux hours

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* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Dark Skin			38.5		8.1		13.7	
B1	Light Skin			68.0		13.4		18.2	
C1	Blue sky			53.1		-9.5		-16.2	
D1	Foliage			39.2		-8.2		15.9	
E1	blue flower			59.1		2.6		-18.9	
F1	bluish green			72.6		-28.7		0.7	
A1	orange			63.6		28.2		50.5	
B2	purplish blue			44.6		-1.3		-36.6	
C2	moderate red			53.6		38.9		15.4	
D2	purple			34.3		14.0		-14.5	
E2	yellow green			73.1		-18.1		52.7	
F2	orange yellow			72.3		14.5		63.0	
A3	blue			34.0		1.0		-39.7	
B3	green			53.7		-28.1		27.7	
C3	red			44.1		42.7		22.5	
D3	yellow			80.6		3.2		75.1	
E3	magenta			55.0		41.2		-11.7	
F3	cyan			54.3		-24.5		-22.9	
A4	white			94.8		1.2		-3.5	
B4	neutral 8			81.9		-1.1		-2.7	
C4	neutral 6.5			69.5		-1.8		1.7	
D4	neutral 5			51.2		-2.1		2.7	
E4	neutral 3.5			34.2		-1.9		2.2	
F4	black			19.3		-0.8		0.3	
A5	paper white			97.3		1.9		-6.4	
B5	Skin highlight L*=88			87.7		9.4		9.8	
C5	Skin highlight L* =75			76.7		15.0		18.2	
D5	Skin shadow L*=28			24.7		8.7		10.3	
E5	Skin shadow L*=13			12.8		4.7		1.9	
F5	Maximum Black			9.3		0.2		-1.9	

Summary Results	I* Color	I* tone	ΔE
Average Score for all patches			
Worst 10% (3 lowest scoring patches)			

180 Megalux hours