Aardenburg

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IMAGING & ARCHIVES

Accelerated Light Fading Test Results

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

Sample # AaI_20080422_SN001
100 Megalux-hours completed

Conservation Display Rating *	
Lower Exposure Limit (Megalux hours)	Upper Exposure limit (Megalux hours)
2	3

* 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 an explanation of the conservation display ratings.

Document #: AaI_20080422_SN001Lf.pdf Rev: November 19, 2009
Test Print Prepared by: Aardenburg Imaging & Archives

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About this Report

This report contains light fastness information about a single 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 2). 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 the Test Results



AaI_StandardColorSet(v2)forSRGB.tif

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 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 presentation of the target images simulates looking at the light-exposed print along side a perfect duplicate of the unexposed original print. The "Before/After" Layer mode takes advantage of Adobe Reader Layer technology. Toggle the "Before/After" layer on and off using the layers feature of Adobe Reader to directly switch between the light exposed print colors and the initial print colors for the image located on the right side of each page. 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. It was a major reason behind the development of the I* metric.

Sample Description

Printer: Epson 1270
Ink: Epson OEM ink
Paper: Epson Premium Glossy Photo Paper

Sample #: AaI_20080422_SN001
Test Print Prepared by: AaI&A
Membership category: n.a



AaI_StandardColorSet(v2)forSRGB.tif

Test Image: AaI_StandardColorSet(v2)forSRGB.tif
RIP/Driver settings: CS2/ Epson OEM, Photo-1440dpi, color controls = "Vivid", gamma = 1.8, Highspeed = "off, High quality Halftoning
Media Setting: Epson Premium Glossy

Printed: April 22, 2008
Original print colors measured on: May 09, 2008
Test started on: May 10, 2008

Profile: AaI_EpPrGlPh(1a) **Rendering Intent:** Perceptual
Profile type: custom
Profile Creation Software: Gretag/Macbeth Profilemaker 5.0.8

Paper White Color (UV–included versus UV–excluded) and Maximum Printed Black						
Optical Brighteners present? yes**	L*		a*		b*	
	UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
Maximum Paper White (no colorants printed)	94.4	94.5	-0.5	-0.8	-3.8	-2.7
(1) ΔL*, Δa*, Δb* respectively	0.1		0.3		1.1	
(1) Calculated differences, especially for Δb*, indicate the role and magnitude of fluorescence on original paper color						
Maximum Printed black (UV included)	L* = 5.2		a* = -1.5		b* = -4.4	

Light Source: Phillips Colortone F40T12/C50
Filter/Glazing: Sample framed under Glass*
Light Exposure Cycle: 8 hours on, 4 hours off, twice per 24 hours
Average Illuminance during "on" cycle: 12,270 Lux
Average Temperature: 23.1˚C over full test duration, 24.3˚C during light exposure
Average Relative humidity: 59.0%RH full test period, 59.8%RH during light exposure
CIELAB measurements: D50 2˚ observer, Xrite Gretag/Macbeth Spectrolino/Spectroscan

Replicates/Compare to:

No Replicates are available at this time.

Notes/Comments:

* The Phillips Colortone F40T12/C50 fluorescent light source and ordinary glass picture frame glazing yields UVA content and overall spectral power similar to natural 5000˚K daylight entering a window and then striking a print that has been framed by **standard acrylic glazing** rather than ordinary glass. Other light sources and/or different glazing options may yield greater or lesser fade rates (generally, a 2-5x increase in fade rate for direct sunlight compared to UV–excluded sources at the same Lux level). The spectral quality of the light can also affect individual colors differently.

** OBAs are in the paper core, but not in the image receiving layer.

December 20, 2008 – 40 Megalux-hours: I* tone for the worst 10% of the color elements has now reached negative status. This means tonal relationships are beginning to invert. Compare for example, the purple patch (D2) in relationship to its near neighbor, foliage (D1) at the beginning of test and now at 40 Megalux-hours (see page 8). Also, consider red patch (C3) to its near neighbor neutral 5 patch (D4). Both sets are examples of inverted tone relationships between neighboring colors in the image.

August 25, 2008 – 20 Megalux-hours: Note the severe fading of the high concentration magenta dye, particularly in the dark skin tones and dark neutral patches while the maximum black remains much more stable. The Epson 1270 printer driver is typical of desktop printers that reserve the black ink only for maximum "black" and very near maximum black where the RGB digital values are equal to or very close to 0, 0, 0. Color patch F5 in the test target image is RGB=0, 0, 0 and prints with only black ink. In contrast, other dark colors (e.g., D2, E4, F4, D5, E5) get printed with large amounts of cyan, magenta, and yellow, but little or no black ink. As the print fades over time the black only ink locations will no longer appear blended visually due to the discrepancy in fading rates between the high concentration magenta in the blend colors and any solitary black ink areas that may be part of the original image content. The prints made on this system can then acquire a "posterized" appearance that would not occur otherwise in traditional color photographs as they fade. Similarly, note the large discrepancy in fading between the dark skin tones and the lighter skin tones plus the false colors (i.e., negative I* color values) that are now present. Portraiture made with this system will fade to a disturbingly odd appearance with parts of the faces in shadow turning sickly green while lighter skin tones retain more plausible color fidelity.

Table to Convert Megalux-hours of Light Exposure to estimated "Years on Display"											
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

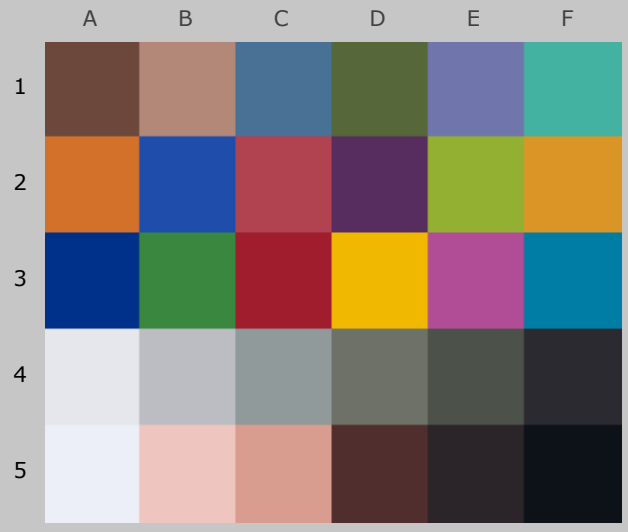
Light levels commonly encountered in the real world fluctuate widely throughout indoor print display environments and produce large variations in how long it takes for artwork to acquire light-induced damage. Use this table as a guide to estimate how many "years on display" (denoted in red text) it takes to accumulate the light exposure test 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 print display 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 humidity cycling can cause physical cracks and/or flaking, etc. Handling damage such as scratching, abrasion, tears and creases, and catastrophic damage by smoke, fire, flood, etc., also degrade print quality over time. Thus, as illumination levels are reduced other forms of degradation take on greater proportion of risk and may appear in shorter time intervals.

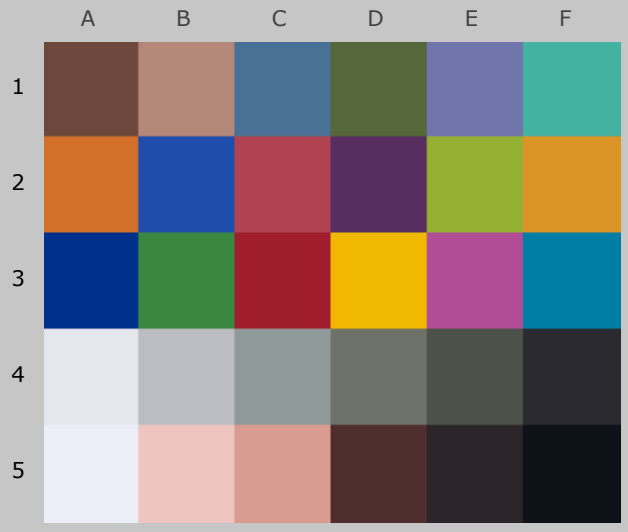
(1) Eastman Kodak has cited this exposure condition and 90% confidence limit as a rationale for estimating print fading times of traditional color photo materials in typical home display environments. For recent light fading claims regarding its line of pigment-based inkjet printers, Kodak has adopted 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) has standardized its light fastness ratings on 450 lux for 12 hours per day in order to estimate the years on display necessary to reach "noticeable" fading. This average light exposure condition, an assumed 75°F/60%RH temperature and humidity level, and WIR's visually weighted densitometric endpoint criteria set V3.0 has become a de facto industry standard for most predictive light fading estimates in the absence of a published International Standards Organization (ISO) test standard.

100color/100tone



Original Print Colors
(measured before light exposure)



Colors at Zero Megalux-hours of Light Exposure
(same as original print colors)

Epson 1270, Epson OEM Ink, Epson Premium Glossy Photo Paper

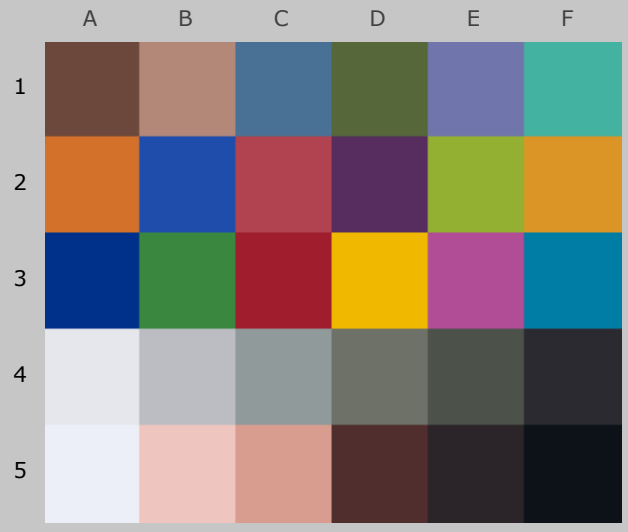
Original Print Colors as Measured and at Start of Test									
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	100	0.0	34.3		15.0		12.6	
B1	light Skin	100	0.0	60.8		16.4		14.7	
C1	blue sky	100	0.0	46.0		-7.0		-24.2	
D1	foliage	100	0.0	41.0		-12.6		23.1	
E1	blue flower	100	0.0	50.6		7.5		-30.1	
F1	bluish green	100	0.0	65.7		-35.8		-0.8	
A2	orange	100	0.0	58.6		35.7		53.6	
B2	purplish blue	100	0.0	34.3		13.1		-56.1	
C2	moderate red	100	0.0	44.4		45.8		17.0	
D2	purple	100	0.0	25.9		26.3		-22.3	
E2	yellow green	100	0.0	68.0		-23.2		57.3	
F2	orange yellow	100	0.0	67.5		21.3		63.8	
A3	blue	100	0.0	21.9		14.9		-56.0	
B3	green	100	0.0	50.6		-36.7		30.7	
C3	red	100	0.0	35.6		52.7		27.3	
D3	yellow	100	0.0	78.3		11.2		82.8	
E3	magenta	100	0.0	48.2		48.4		-20.6	
F3	cyan	100	0.0	47.3		-24.0		-30.5	
A4	white	100	0.0	91.8		0.4		-2.5	
B4	neutral 8	100	0.0	76.4		0.0		-3.2	
C4	neutral 6.5	100	0.0	62.6		-2.8		-1.7	
D4	neutral 5	100	0.0	47.1		-3.2		4.7	
E4	neutral 3.5	100	0.0	33.8		-2.9		4.2	
F4	black	100	0.0	17.6		1.9		-3.9	
A5	paper white	100	0.0	94.4		-0.1		-3.9	
B5	skin highlight L*=89	100	0.0	83.2		14.0		9.4	
C5	skin highlight L*=75	100	0.0	70.1		20.7		16.8	
D5	skin shadow L*=25	100	0.0	23.0		15.7		6.8	
E5	skin shadow L*=11	100	0.0	15.4		4.4		-0.9	
F5	Max Black	100	0.0	5.2		-1.5		-4.4	

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	100	100	0.0
Average Score for the Worst 10% (3 lowest scoring patches)	100	100	0.0

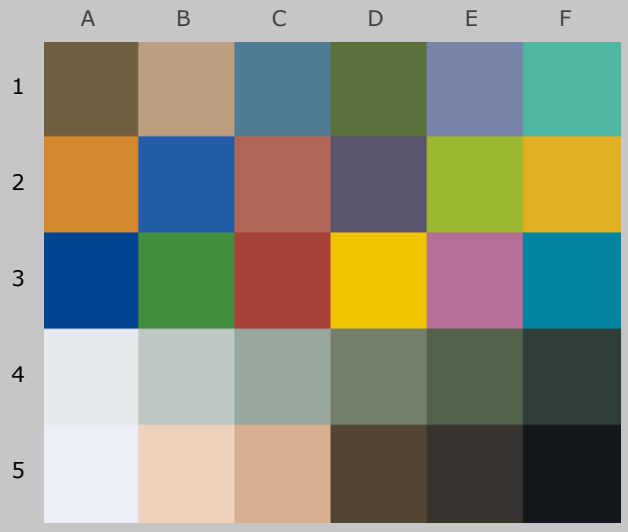


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65.4color/78.3tone



Original Print Colors
(measured before light exposure)



Colors after 10 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

10 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

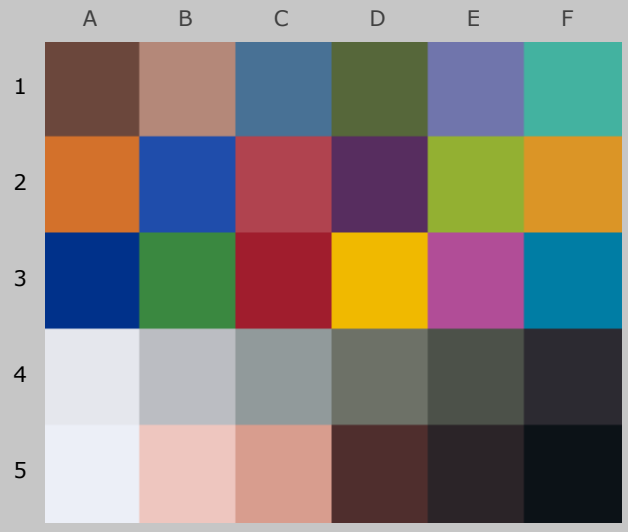
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	37.4	14.4	34.3	41.0	15.0	4.3	12.6	19.6
B1	light Skin	54.7	12.3	60.8	67.3	16.4	8.0	14.7	20.9
C1	blue sky	72.5	8.3	46.0	49.8	-7.0	-10.7	-24.2	-17.7
D1	foliage	83.0	6.1	41.0	44.5	-12.6	-15.4	23.1	27.2
E1	blue flower	69.6	10.9	50.6	55.1	7.5	1.5	-30.1	-22.2
F1	bluish green	97.2	2.6	65.7	67.8	-35.8	-35.4	-0.8	0.7
A2	orange	83.2	12.7	58.6	64.2	35.7	25.5	53.6	58.6
B2	purplish blue	76.4	14.8	34.3	38.9	13.1	2.6	-56.1	-46.7
C2	moderate red	67.4	18.0	44.4	51.7	45.8	30.4	17.0	22.7
D2	purple	38.0	24.6	25.9	37.1	26.3	6.8	-22.3	-12.5
E2	yellow green	94.2	5.0	68.0	70.8	-23.2	-24.0	57.3	61.4
F2	orange yellow	81.2	14.9	67.5	74.5	21.3	10.5	63.8	71.3
A3	blue	74.3	16.4	21.9	27.4	14.9	0.7	-56.0	-50.0
B3	green	94.6	3.8	50.6	52.8	-36.7	-36.7	30.7	33.8
C3	red	82.9	12.6	35.6	42.3	52.7	42.1	27.3	28.0
D3	yellow	92.6	7.3	78.3	81.3	11.2	6.3	82.8	87.3
E3	magenta	63.9	20.7	48.2	55.3	48.4	33.1	-20.6	-8.6
F3	cyan	90.1	5.0	47.3	49.8	-24.0	-25.6	-30.5	-26.5
A4	white	90.8	1.6	91.8	92.6	0.4	-0.8	-2.5	-1.8
B4	neutral 8	44.2	6.6	76.4	79.6	0.0	-4.2	-3.2	0.9
C4	neutral 6.5	37.6	7.8	62.6	67.1	-2.8	-7.2	-1.7	3.0
D4	neutral 5	39.8	7.5	47.1	51.3	-3.2	-7.2	4.7	9.5
E4	neutral 3.5	1.5	11.4	33.8	39.6	-2.9	-10.4	4.2	10.6
F4	black	1.2	12.1	17.6	24.7	1.9	-6.6	-3.9	1.2
A5	paper white	100.0	0.5	94.4	94.7	-0.1	0.0	-3.9	-4.4
B5	skin highlight L*=89	57.8	8.2	83.2	86.3	14.0	7.8	9.4	13.8
C5	skin highlight L*=75	64.6	11.1	70.1	75.0	20.7	12.1	16.8	21.6
D5	skin shadow L*=25	24.7	15.4	23.0	30.5	15.7	3.8	6.8	13.0
E5	skin shadow L*=11	47.0	8.2	15.4	21.5	4.4	0.9	-0.9	3.5
F5	Max Black	98.0	2.2	5.2	7.3	-1.5	-0.8	-4.4	-4.1

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	65.4	78.3	10.1
Average Score for the Worst 10% (3 lowest scoring patches)	9.2	55.5	21.1

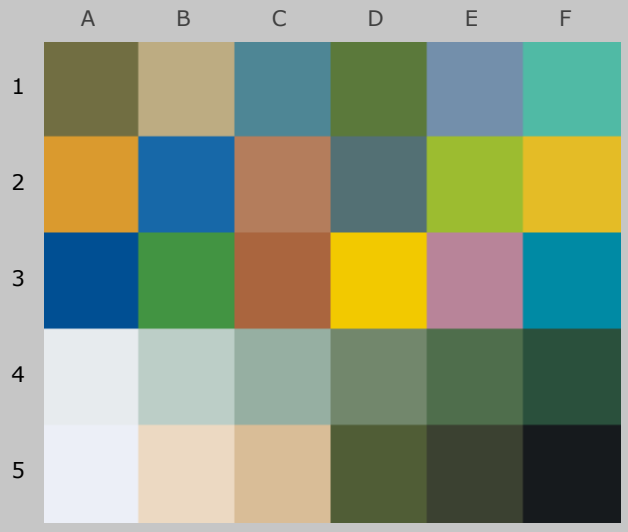


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34.7 color / 64.8 tone



Original Print Colors
(measured before light exposure)



Colors after 20 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

20 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

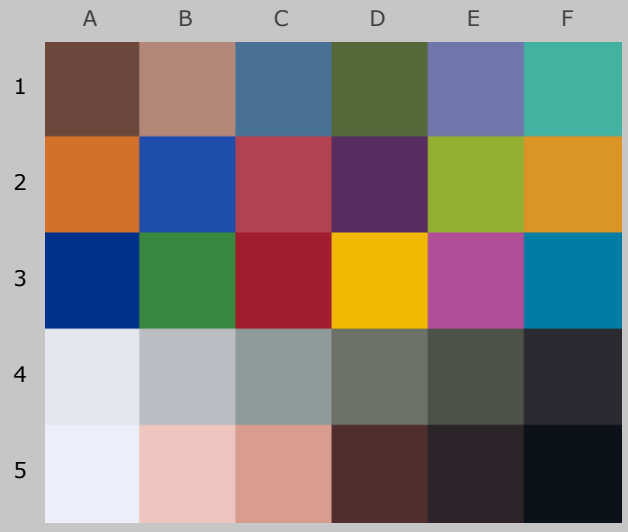
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-14.6	25.7	34.3	45.7	15.0	-4.4	12.6	25.0
B1	light Skin	25.8	19.7	60.8	71.1	16.4	2.2	14.7	23.6
C1	blue sky	49.8	14.7	46.0	52.5	-7.0	-15.8	-24.2	-14.5
D1	foliage	61.8	12.3	41.0	47.4	-12.6	-20.1	23.1	30.5
E1	blue flower	47.3	18.5	50.6	58.2	7.5	-4.6	-30.1	-18.3
F1	bluish green	96.9	3.6	65.7	69.0	-35.8	-36.3	-0.8	0.8
A2	orange	70.9	21.7	58.6	68.6	35.7	18.4	53.6	62.2
B2	purplish blue	60.0	24.8	34.3	42.0	13.1	-5.5	-56.1	-41.6
C2	moderate red	42.7	31.5	44.4	57.8	45.8	19.2	17.0	27.3
D2	purple	-12.3	43.7	25.9	45.2	26.3	-9.5	-22.3	-6.3
E2	yellow green	93.4	6.3	68.0	72.3	-23.2	-25.0	57.3	61.5
F2	orange yellow	72.2	21.9	67.5	78.1	21.3	4.7	63.8	73.4
A3	blue	58.5	26.2	21.9	31.0	14.9	-8.1	-56.0	-47.3
B3	green	90.3	6.6	50.6	54.7	-36.7	-39.3	30.7	35.1
C3	red	55.2	30.9	35.6	50.4	52.7	26.4	27.3	33.7
D3	yellow	90.1	9.8	78.3	82.8	11.2	3.7	82.8	87.3
E3	magenta	41.7	33.7	48.2	60.9	48.4	22.8	-20.6	-2.9
F3	cyan	80.7	9.1	47.3	51.7	-24.0	-29.1	-30.5	-24.4
A4	white	86.5	2.0	91.8	92.8	0.4	-1.3	-2.5	-1.9
B4	neutral 8	17.3	9.6	76.4	81.2	0.0	-7.0	-3.2	1.5
C4	neutral 6.5	-2.5	12.3	62.6	69.4	-2.8	-11.0	-1.7	4.4
D4	neutral 5	-17.4	13.7	47.1	54.3	-3.2	-12.3	4.7	11.9
E4	neutral 3.5	-80.3	20.0	33.8	43.3	-2.9	-17.2	4.2	14.7
F4	black	-135.7	26.2	17.6	30.4	1.9	-18.1	-3.9	7.4
A5	paper white	100.0	0.3	94.4	94.5	-0.1	0.0	-3.9	-4.2
B5	skin highlight L*=89	41.6	11.3	83.2	87.9	14.0	4.5	9.4	13.5
C5	skin highlight L*=75	42.3	17.9	70.1	78.3	20.7	6.1	16.8	23.0
D5	skin shadow L*=25	-75.2	33.9	23.0	37.8	15.7	-11.1	6.8	21.4
E5	skin shadow L*=11	-39.8	17.7	15.4	26.6	4.4	-5.2	-0.9	9.1
F5	Max Black	94.3	4.1	5.2	9.1	-1.5	-1.5	-4.4	-3.3

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	34.7	64.8	17.7
Average Score for the Worst 10% (3 lowest scoring patches)	-97.1	25.2	37.1

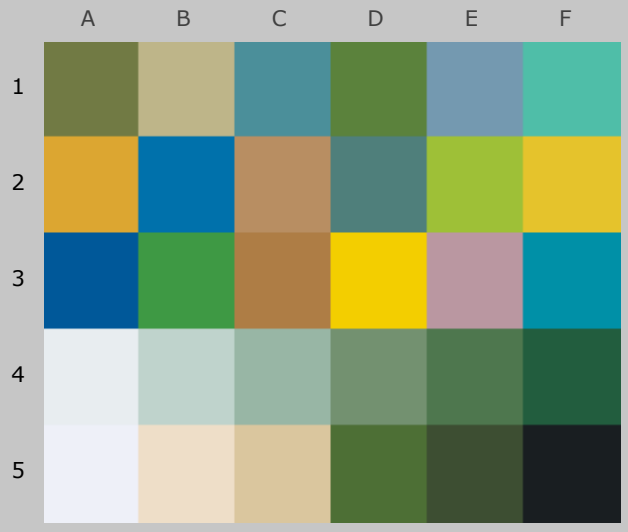


Aardenburg Imaging & Archives

13.2color/56.7tone



Original Print Colors
(measured before light exposure)



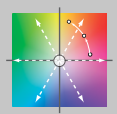
Colors after 30 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

30 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

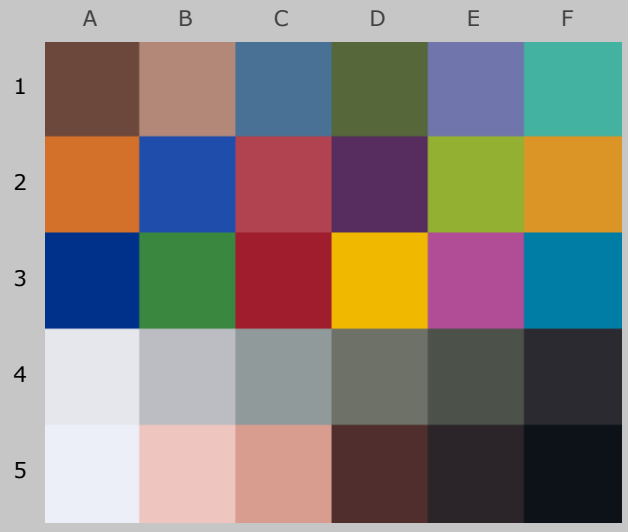
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-49.5	33.4	34.3	49.2	15.0	-10.3	12.6	28.5
B1	light Skin	8.0	24.5	60.8	73.8	16.4	-1.9	14.7	24.5
C1	blue sky	32.0	19.9	46.0	55.2	-7.0	-20.2	-24.2	-12.5
D1	foliage	43.5	17.8	41.0	50.1	-12.6	-24.2	23.1	33.2
E1	blue flower	32.1	23.9	50.6	61.0	7.5	-8.9	-30.1	-16.1
F1	bluish green	96.2	4.7	65.7	70.0	-35.8	-36.9	-0.8	0.7
A2	orange	62.0	28.3	58.6	72.0	35.7	13.1	53.6	64.3
B2	purplish blue	48.9	31.7	34.3	44.8	13.1	-11.3	-56.1	-38.8
C2	moderate red	27.7	40.0	44.4	62.2	45.8	12.4	17.0	30.0
D2	purple	-38.3	53.9	25.9	50.0	26.3	-18.0	-22.3	-3.3
E2	yellow green	93.1	7.3	68.0	73.5	-23.2	-25.7	57.3	61.4
F2	orange yellow	68.4	25.1	67.5	80.1	21.3	1.8	63.8	73.4
A3	blue	49.2	32.1	21.9	33.5	14.9	-13.4	-56.0	-46.0
B3	green	85.3	9.7	50.6	56.6	-36.7	-41.6	30.7	36.4
C3	red	35.1	44.2	35.6	56.3	52.7	15.2	27.3	38.1
D3	yellow	88.7	11.4	78.3	83.9	11.2	2.1	82.8	86.7
E3	magenta	26.7	42.8	48.2	65.8	48.4	15.4	-20.6	0.2
F3	cyan	72.5	12.9	47.3	53.8	-24.0	-32.2	-30.5	-22.9
A4	white	84.8	2.4	91.8	93.3	0.4	-1.4	-2.5	-1.8
B4	neutral 8	7.6	11.1	76.4	82.6	0.0	-8.2	-3.2	1.3
C4	neutral 6.5	-26.8	15.4	62.6	71.6	-2.8	-13.5	-1.7	5.0
D4	neutral 5	-64.3	19.1	47.1	57.3	-3.2	-16.5	4.7	13.8
E4	neutral 3.5	-142.6	26.7	33.8	46.4	-2.9	-22.2	4.2	17.8
F4	black	-237.2	36.8	17.6	34.9	1.9	-26.4	-3.9	12.2
A5	paper white	100.0	0.4	94.4	94.8	-0.1	-0.1	-3.9	-4.0
B5	skin highlight L*=89	34.7	13.0	83.2	89.3	14.0	3.0	9.4	12.8
C5	skin highlight L*=75	30.3	21.9	70.1	80.9	20.7	2.7	16.8	23.0
D5	skin shadow L*=25	-143.5	46.7	23.0	43.2	15.7	-21.0	6.8	27.6
E5	skin shadow L*=11	-120.4	26.5	15.4	30.9	4.4	-11.1	-0.9	14.0
F5	Max Black	92.2	5.9	5.2	10.9	-1.5	-2.1	-4.4	-3.3

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	13.2	56.7	23.0
Average Score for the Worst 10% (3 lowest scoring patches)	-174.5	7.5	48.3

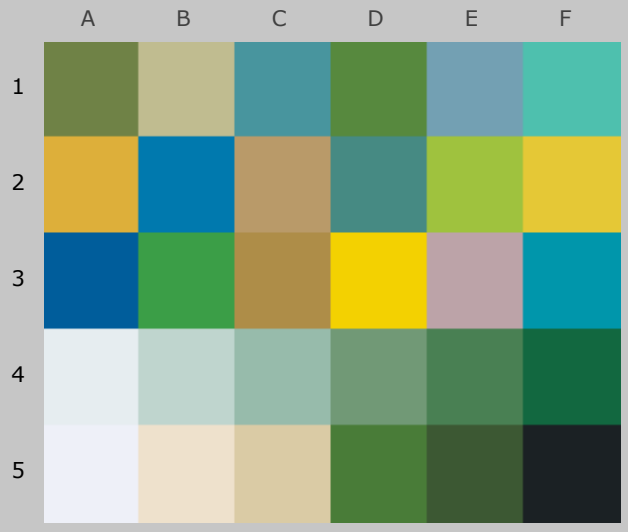


Aardenburg Imaging & Archives

-1.4color/51.2tone



Original Print Colors
(measured before light exposure)



Colors after 40 Megalux-hours
light exposure

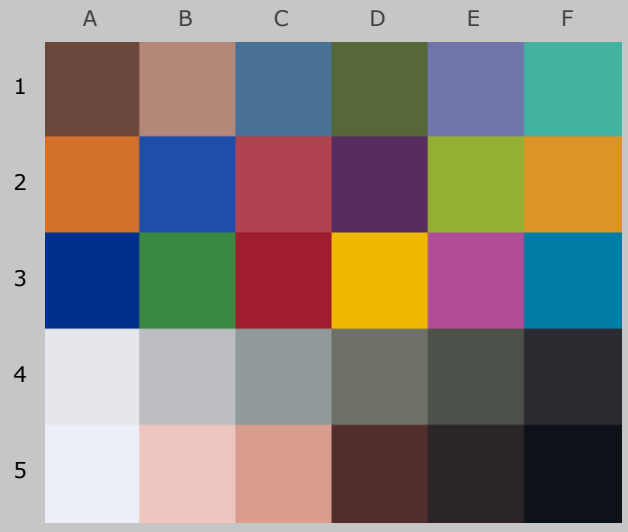
Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

40 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

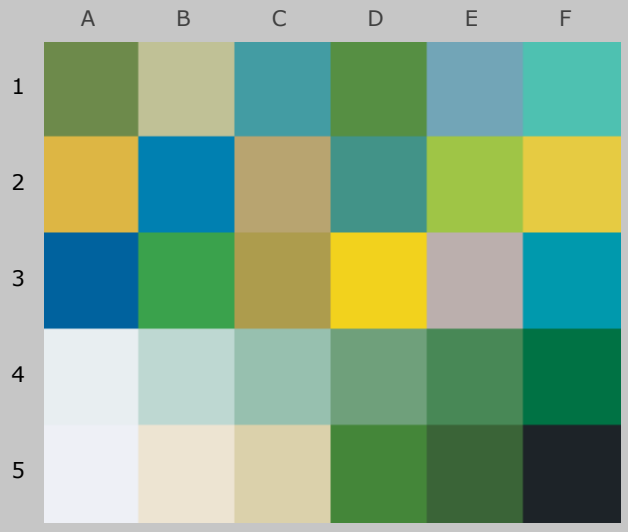
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-72.5	38.6	34.3	51.9	15.0	-14.9	12.6	29.6
B1	light Skin	0.6	26.8	60.8	75.6	16.4	-4.3	14.7	23.1
C1	blue sky	21.6	23.2	46.0	57.4	-7.0	-23.4	-24.2	-12.3
D1	foliage	31.4	21.6	41.0	52.2	-12.6	-27.8	23.1	33.8
E1	blue flower	23.1	27.3	50.6	63.0	7.5	-12.0	-30.1	-15.5
F1	bluish green	97.4	5.3	65.7	70.8	-35.8	-37.2	-0.8	-0.5
A2	orange	56.9	32.3	58.6	74.3	35.7	9.0	53.6	63.0
B2	purplish blue	40.7	36.9	34.3	47.0	13.1	-16.0	-56.1	-37.3
C2	moderate red	17.1	46.1	44.4	65.4	45.8	7.0	17.0	30.3
D2	purple	-54.2	60.2	25.9	53.1	26.3	-23.6	-22.3	-2.5
E2	yellow green	94.9	7.3	68.0	74.3	-23.2	-26.3	57.3	59.4
F2	orange yellow	67.2	26.4	67.5	81.2	21.3	-0.1	63.8	71.1
A3	blue	41.9	36.7	21.9	35.4	14.9	-17.5	-56.0	-45.0
B3	green	82.8	11.5	50.6	58.1	-36.7	-43.7	30.7	35.9
C3	red	19.8	54.3	35.6	60.7	52.7	6.5	27.3	40.7
D3	yellow	88.2	12.1	78.3	84.6	11.2	0.9	82.8	84.0
E3	magenta	16.1	49.3	48.2	69.3	48.4	9.6	-20.6	1.5
F3	cyan	67.1	15.5	47.3	55.3	-24.0	-34.7	-30.5	-22.5
A4	white	84.4	2.6	91.8	93.5	0.4	-1.5	-2.5	-2.0
B4	neutral 8	2.8	12.0	76.4	83.4	0.0	-8.9	-3.2	0.8
C4	neutral 6.5	-39.9	17.2	62.6	73.0	-2.8	-15.2	-1.7	4.5
D4	neutral 5	-94.0	22.7	47.1	59.5	-3.2	-19.9	4.7	13.6
E4	neutral 3.5	-186.1	31.5	33.8	48.9	-2.9	-26.5	4.2	18.7
F4	black	-313.3	44.8	17.6	38.3	1.9	-33.1	-3.9	15.1
A5	paper white	100.0	0.5	94.4	94.9	-0.1	-0.1	-3.9	-3.7
B5	skin highlight L*=89	31.0	13.9	83.2	90.0	14.0	2.0	9.4	11.5
C5	skin highlight L*=75	24.9	23.9	70.1	82.4	20.7	0.7	16.8	21.4
D5	skin shadow L*=25	-191.4	55.7	23.0	46.9	15.7	-28.3	6.8	31.3
E5	skin shadow L*=11	-194.1	34.3	15.4	34.6	4.4	-17.3	-0.9	17.6
F5	Max Black	93.8	6.9	5.2	12.0	-1.5	-2.1	-4.4	-3.5

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-1.4	51.2	26.6
Average Score for the Worst 10% (3 lowest scoring patches)	-232.9	-5.5	56.7

-14.5 color / 46.1 tone



Original Print Colors
(measured before light exposure)



Colors after 50 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

50 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

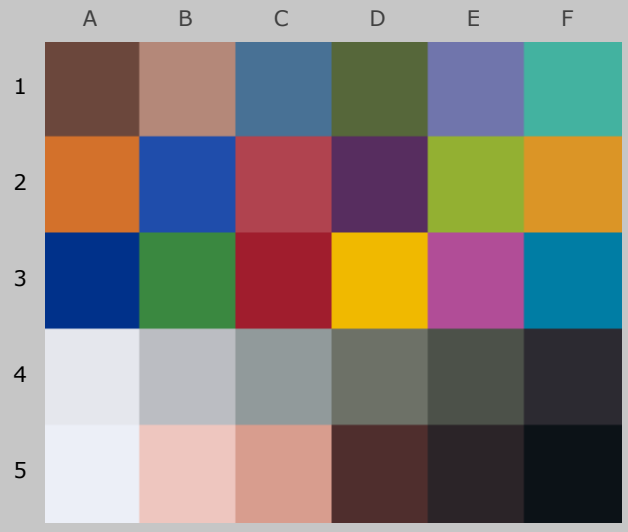
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-91.1	42.9	34.3	54.2	15.0	-18.6	12.6	30.3
B1	light Skin	-5.0	28.7	60.8	77.1	16.4	-6.2	14.7	21.5
C1	blue sky	13.6	25.8	46.0	59.1	-7.0	-25.7	-24.2	-12.1
D1	foliage	21.0	25.0	41.0	54.1	-12.6	-30.8	23.1	34.2
E1	blue flower	15.3	30.3	50.6	64.8	7.5	-14.5	-30.1	-14.9
F1	bluish green	96.8	6.0	65.7	71.5	-35.8	-37.1	-0.8	-1.8
A2	orange	52.9	35.5	58.6	76.2	35.7	5.8	53.6	61.4
B2	purplish blue	34.1	41.1	34.3	48.9	13.1	-19.7	-56.1	-36.0
C2	moderate red	8.0	51.4	44.4	68.4	45.8	2.4	17.0	30.3
D2	purple	-65.8	64.9	25.9	55.7	26.3	-27.7	-22.3	-2.1
E2	yellow green	95.3	7.8	68.0	75.0	-23.2	-26.6	57.3	57.3
F2	orange yellow	66.2	27.5	67.5	82.2	21.3	-1.5	63.8	68.3
A3	blue	36.4	40.3	21.9	36.9	14.9	-20.6	-56.0	-44.3
B3	green	80.6	13.2	50.6	59.4	-36.7	-45.3	30.7	35.5
C3	red	6.6	63.0	35.6	64.6	52.7	-1.0	27.3	42.7
D3	yellow	86.8	13.4	78.3	85.2	11.2	-0.1	82.8	80.7
E3	magenta	6.4	55.3	48.2	72.6	48.4	4.4	-20.6	2.6
F3	cyan	62.6	17.7	47.3	56.6	-24.0	-36.6	-30.5	-22.2
A4	white	84.9	2.7	91.8	93.7	0.4	-1.5	-2.5	-2.1
B4	neutral 8	-1.3	12.8	76.4	84.3	0.0	-9.6	-3.2	0.1
C4	neutral 6.5	-53.0	19.1	62.6	74.4	-2.8	-16.7	-1.7	4.0
D4	neutral 5	-122.1	26.1	47.1	61.7	-3.2	-22.8	4.7	13.6
E4	neutral 3.5	-225.0	35.9	33.8	51.3	-2.9	-30.2	4.2	19.7
F4	black	-378.1	51.7	17.6	41.5	1.9	-38.8	-3.9	17.5
A5	paper white	100.0	0.7	94.4	94.9	-0.1	0.0	-3.9	-3.5
B5	skin highlight L*=89	25.7	15.1	83.2	91.0	14.0	1.0	9.4	10.1
C5	skin highlight L*=75	17.7	26.4	70.1	84.0	20.7	-1.5	16.8	20.0
D5	skin shadow L*=25	-231.2	63.3	23.0	50.3	15.7	-34.4	6.8	34.3
E5	skin shadow L*=11	-267.8	42.2	15.4	38.4	4.4	-23.4	-0.9	21.2
F5	Max Black	95.9	8.1	5.2	13.2	-1.5	-2.2	-4.4	-3.9

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-14.5	46.1	29.8
Average Score for the Worst 10% (3 lowest scoring patches)	-292.4	-18.6	63.8

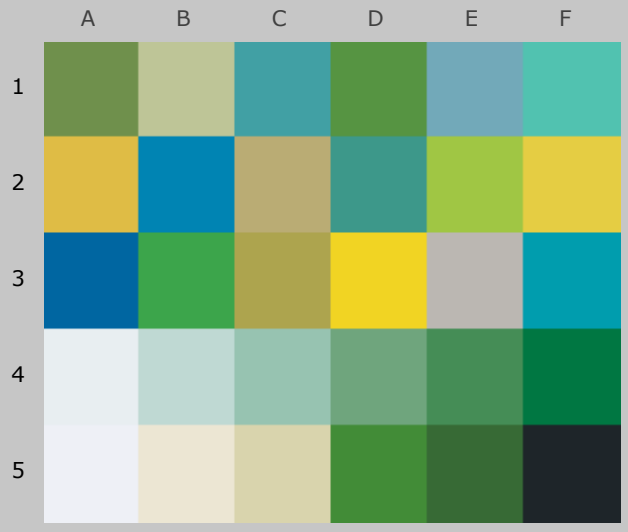


Aardenburg Imaging & Archives

-24.4color/43.1tone



Original Print Colors
(measured before light exposure)



Colors after 60 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

60 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

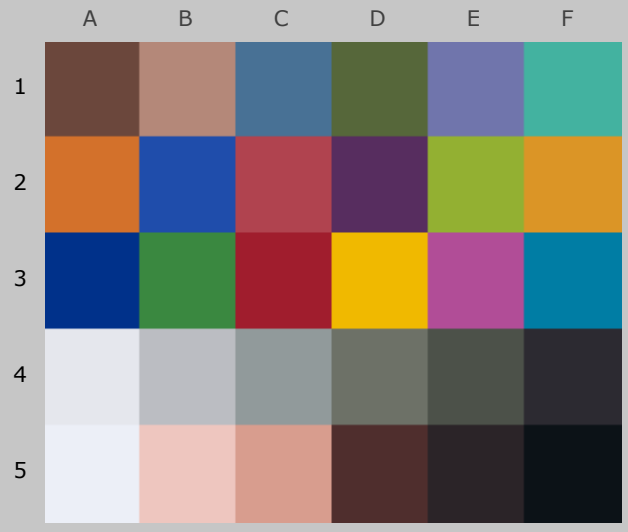
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-108.6	46.8	34.3	56.0	15.0	-21.4	12.6	32.4
B1	light Skin	-12.2	30.5	60.8	78.1	16.4	-7.7	14.7	22.1
C1	blue sky	4.5	28.4	46.0	60.4	-7.0	-27.8	-24.2	-11.2
D1	foliage	10.6	28.1	41.0	55.5	-12.6	-32.9	23.1	36.0
E1	blue flower	8.8	32.7	50.6	66.1	7.5	-16.4	-30.1	-14.0
F1	bluish green	96.6	6.4	65.7	71.9	-35.8	-37.5	-0.8	-1.2
A2	orange	49.6	38.0	58.6	77.5	35.7	3.8	53.6	61.9
B2	purplish blue	29.5	44.1	34.3	50.3	13.1	-22.2	-56.1	-35.2
C2	moderate red	0.9	55.5	44.4	70.4	45.8	-1.0	17.0	31.4
D2	purple	-74.5	68.3	25.9	57.3	26.3	-30.5	-22.3	-1.0
E2	yellow green	95.1	8.2	68.0	75.4	-23.2	-26.7	57.3	57.7
F2	orange yellow	65.1	28.4	67.5	82.8	21.3	-2.3	63.8	68.0
A3	blue	32.3	42.9	21.9	38.0	14.9	-22.9	-56.0	-43.7
B3	green	77.2	14.9	50.6	60.2	-36.7	-46.5	30.7	36.6
C3	red	-1.1	68.1	35.6	66.8	52.7	-5.2	27.3	44.8
D3	yellow	86.0	14.2	78.3	85.5	11.2	-0.6	82.8	79.7
E3	magenta	1.0	58.8	48.2	74.5	48.4	1.4	-20.6	2.9
F3	cyan	58.1	19.7	47.3	57.5	-24.0	-38.1	-30.5	-21.4
A4	white	84.3	2.8	91.8	93.7	0.4	-1.5	-2.5	-2.0
B4	neutral 8	-7.7	13.6	76.4	84.7	0.0	-10.2	-3.2	0.3
C4	neutral 6.5	-65.3	20.5	62.6	75.2	-2.8	-17.8	-1.7	4.5
D4	neutral 5	-148.8	29.0	47.1	63.2	-3.2	-25.1	4.7	14.8
E4	neutral 3.5	-260.2	39.6	33.8	52.9	-2.9	-33.0	4.2	21.6
F4	black	-415.3	55.6	17.6	43.1	1.9	-41.7	-3.9	19.5
A5	paper white	96.8	0.9	94.4	94.9	-0.1	-0.1	-3.9	-3.1
B5	skin highlight L*=89	22.6	15.8	83.2	91.4	14.0	0.4	9.4	9.6
C5	skin highlight L*=75	13.0	27.9	70.1	84.8	20.7	-2.7	16.8	20.0
D5	skin shadow L*=25	-251.9	67.3	23.0	52.0	15.7	-37.2	6.8	36.6
E5	skin shadow L*=11	-311.0	46.8	15.4	40.4	4.4	-26.6	-0.9	23.8
F5	Max Black	94.1	9.1	5.2	14.2	-1.5	-2.4	-4.4	-3.9

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-24.4	43.1	32.1
Average Score for the Worst 10% (3 lowest scoring patches)	-328.8	-26.8	67.9

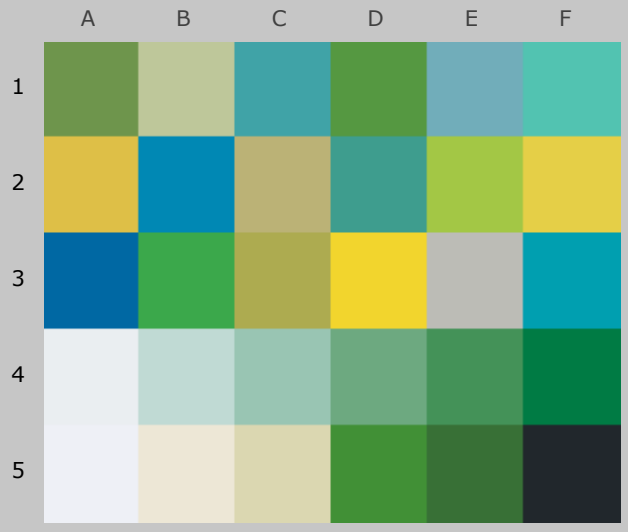


Aardenburg Imaging & Archives

-31.3color/40.5tone



Original Print Colors
(measured before light exposure)



Colors after 70 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

70 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

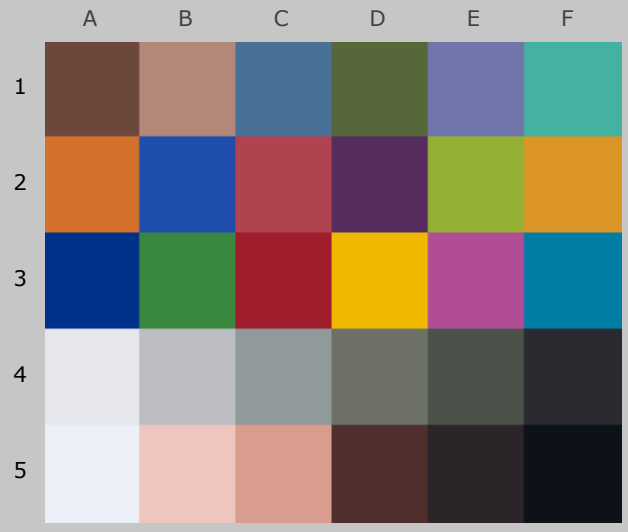
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-122.7	50.0	34.3	57.6	15.0	-23.7	12.6	33.9
B1	light Skin	-15.7	31.7	60.8	79.0	16.4	-8.6	14.7	21.6
C1	blue sky	-0.9	30.2	46.0	61.5	-7.0	-29.1	-24.2	-10.7
D1	foliage	1.7	30.7	41.0	56.8	-12.6	-34.5	23.1	37.8
E1	blue flower	4.4	34.4	50.6	67.2	7.5	-17.6	-30.1	-13.5
F1	bluish green	97.0	6.7	65.7	72.2	-35.8	-37.3	-0.8	-1.2
A2	orange	47.4	39.7	58.6	78.5	35.7	2.2	53.6	61.6
B2	purplish blue	26.1	46.4	34.3	51.6	13.1	-24.2	-56.1	-34.5
C2	moderate red	-4.1	58.5	44.4	72.2	45.8	-3.5	17.0	31.5
D2	purple	-79.9	70.6	25.9	58.7	26.3	-32.3	-22.3	-0.6
E2	yellow green	95.5	8.4	68.0	75.7	-23.2	-26.5	57.3	57.9
F2	orange yellow	64.7	28.9	67.5	83.2	21.3	-2.7	63.8	67.1
A3	blue	29.9	44.5	21.9	38.9	14.9	-24.4	-56.0	-43.8
B3	green	75.0	16.3	50.6	61.0	-36.7	-47.0	30.7	37.7
C3	red	-6.6	71.8	35.6	68.6	52.7	-8.2	27.3	46.2
D3	yellow	85.1	14.9	78.3	85.7	11.2	-0.9	82.8	78.2
E3	magenta	-2.6	61.1	48.2	76.1	48.4	-0.7	-20.6	2.9
F3	cyan	55.4	20.9	47.3	58.3	-24.0	-39.1	-30.5	-20.9
A4	white	85.2	2.8	91.8	93.8	0.4	-1.5	-2.5	-2.0
B4	neutral 8	-7.5	13.9	76.4	85.2	0.0	-10.3	-3.2	0.0
C4	neutral 6.5	-71.5	21.4	62.6	75.9	-2.8	-18.5	-1.7	4.5
D4	neutral 5	-166.0	31.1	47.1	64.4	-3.2	-26.6	4.7	15.4
E4	neutral 3.5	-286.9	42.6	33.8	54.4	-2.9	-35.1	4.2	23.1
F4	black	-444.6	58.7	17.6	44.5	1.9	-43.8	-3.9	21.4
A5	paper white	93.6	1.2	94.4	95.0	-0.1	0.0	-3.9	-2.8
B5	skin highlight L*=89	21.0	16.2	83.2	91.8	14.0	0.2	9.4	8.7
C5	skin highlight L*=75	11.4	28.7	70.1	85.6	20.7	-3.3	16.8	19.0
D5	skin shadow L*=25	-267.0	70.2	23.0	53.4	15.7	-39.0	6.8	38.6
E5	skin shadow L*=11	-350.2	51.0	15.4	42.4	4.4	-29.2	-0.9	26.4
F5	Max Black	93.6	10.0	5.2	15.1	-1.5	-2.5	-4.4	-4.0

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-31.3	40.5	33.8
Average Score for the Worst 10% (3 lowest scoring patches)	-360.6	-34.2	70.9

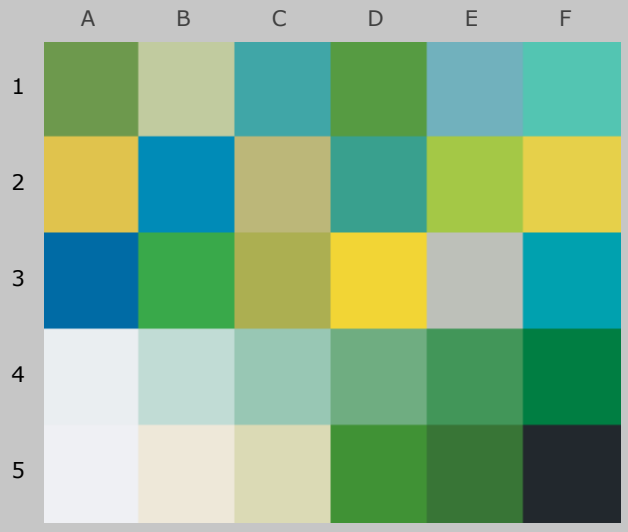


Aardenburg Imaging & Archives

-37.1 color / 38.5 tone



Original Print Colors
(measured before light exposure)



Colors after 80 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

80 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

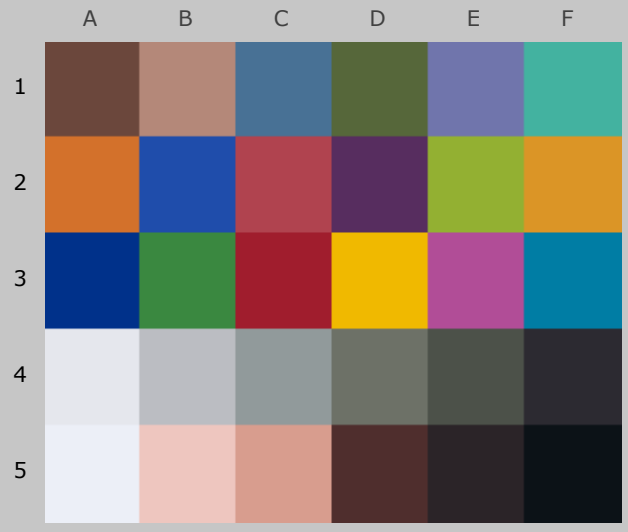
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-134.7	52.7	34.3	58.9	15.0	-25.7	12.6	35.3
B1	light Skin	-19.4	32.8	60.8	79.8	16.4	-9.5	14.7	21.5
C1	blue sky	-6.2	31.8	46.0	62.5	-7.0	-30.3	-24.2	-10.2
D1	foliage	-4.9	32.8	41.0	57.9	-12.6	-35.9	23.1	38.8
E1	blue flower	0.0	36.1	50.6	68.2	7.5	-18.9	-30.1	-13.0
F1	bluish green	97.0	7.1	65.7	72.6	-35.8	-37.3	-0.8	-1.1
A2	orange	45.7	41.2	58.6	79.5	35.7	1.0	53.6	61.3
B2	purplish blue	23.4	48.2	34.3	52.6	13.1	-25.7	-56.1	-34.1
C2	moderate red	-8.1	60.8	44.4	73.6	45.8	-5.5	17.0	31.7
D2	purple	-84.8	72.6	25.9	59.7	26.3	-34.0	-22.3	-0.1
E2	yellow green	95.7	8.6	68.0	76.0	-23.2	-26.3	57.3	58.0
F2	orange yellow	64.4	29.3	67.5	83.6	21.3	-3.1	63.8	66.1
A3	blue	27.8	46.0	21.9	39.7	14.9	-25.7	-56.0	-43.6
B3	green	73.0	17.3	50.6	61.5	-36.7	-47.5	30.7	38.6
C3	red	-11.1	74.8	35.6	69.9	52.7	-10.6	27.3	47.4
D3	yellow	84.1	15.8	78.3	85.9	11.2	-1.1	82.8	76.5
E3	magenta	-5.0	62.8	48.2	77.2	48.4	-2.2	-20.6	2.7
F3	cyan	53.1	22.0	47.3	58.8	-24.0	-39.8	-30.5	-20.5
A4	white	84.9	2.9	91.8	93.9	0.4	-1.5	-2.5	-1.9
B4	neutral 8	-8.6	14.2	76.4	85.6	0.0	-10.4	-3.2	-0.2
C4	neutral 6.5	-77.6	22.2	62.6	76.5	-2.8	-19.1	-1.7	4.5
D4	neutral 5	-181.0	32.8	47.1	65.3	-3.2	-28.0	4.7	15.9
E4	neutral 3.5	-308.8	44.9	33.8	55.5	-2.9	-36.8	4.2	24.2
F4	black	-468.4	61.2	17.6	45.6	1.9	-45.6	-3.9	22.9
A5	paper white	90.1	1.5	94.4	95.0	-0.1	-0.1	-3.9	-2.5
B5	skin highlight L*=89	19.3	16.6	83.2	92.1	14.0	0.0	9.4	7.8
C5	skin highlight L*=75	9.2	29.5	70.1	86.1	20.7	-3.9	16.8	18.2
D5	skin shadow L*=25	-278.2	72.3	23.0	54.2	15.7	-40.4	6.8	40.1
E5	skin shadow L*=11	-380.4	54.2	15.4	43.8	4.4	-31.4	-0.9	28.3
F5	Max Black	95.9	10.7	5.2	15.9	-1.5	-2.3	-4.4	-4.0

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-37.1	38.5	35.2
Average Score for the Worst 10% (3 lowest scoring patches)	-385.9	-38.6	73.2

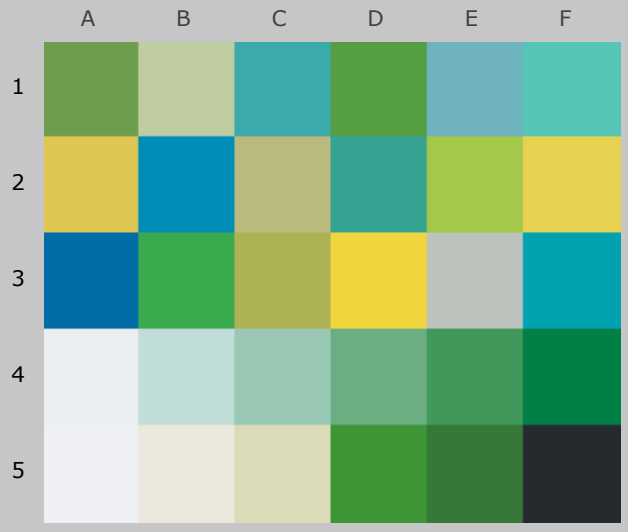


Aardenburg Imaging & Archives

-40.4color/36.7tone



Original Print Colors
(measured before light exposure)



Colors after 90 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

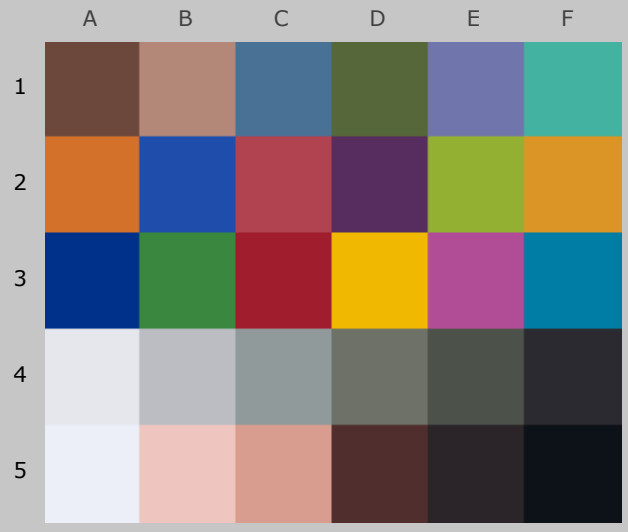
90 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-142.3	54.5	34.3	60.0	15.0	-27.5	12.6	35.0
B1	light Skin	-20.2	33.3	60.8	80.4	16.4	-10.0	14.7	19.9
C1	blue sky	-8.0	32.6	46.0	63.2	-7.0	-31.1	-24.2	-10.7
D1	foliage	-8.8	34.1	41.0	58.7	-12.6	-37.2	23.1	38.7
E1	blue flower	-2.0	36.9	50.6	68.8	7.5	-19.8	-30.1	-13.2
F1	bluish green	96.5	7.3	65.7	72.8	-35.8	-37.0	-0.8	-2.1
A2	orange	44.6	42.1	58.6	80.1	35.7	-0.1	53.6	59.2
B2	purplish blue	21.2	49.7	34.3	53.3	13.1	-27.1	-56.1	-33.9
C2	moderate red	-10.5	62.3	44.4	74.6	45.8	-7.0	17.0	30.4
D2	purple	-87.2	73.7	25.9	60.5	26.3	-35.0	-22.3	-0.7
E2	yellow green	95.9	8.7	68.0	76.1	-23.2	-26.1	57.3	56.5
F2	orange yellow	64.0	29.6	67.5	83.8	21.3	-3.4	63.8	63.6
A3	blue	26.0	47.2	21.9	40.3	14.9	-26.7	-56.0	-43.6
B3	green	72.7	17.6	50.6	61.9	-36.7	-48.0	30.7	38.2
C3	red	-14.2	76.8	35.6	70.9	52.7	-12.5	27.3	47.5
D3	yellow	81.5	17.7	78.3	86.0	11.2	-1.5	82.8	73.1
E3	magenta	-6.5	63.8	48.2	77.9	48.4	-3.4	-20.6	2.1
F3	cyan	52.7	22.4	47.3	59.3	-24.0	-40.2	-30.5	-20.8
A4	white	86.2	2.7	91.8	93.8	0.4	-1.4	-2.5	-2.1
B4	neutral 8	-6.9	14.1	76.4	85.7	0.0	-10.4	-3.2	-0.9
C4	neutral 6.5	-78.2	22.5	62.6	76.9	-2.8	-19.4	-1.7	3.7
D4	neutral 5	-186.4	33.6	47.1	66.1	-3.2	-28.9	4.7	14.9
E4	neutral 3.5	-321.4	46.4	33.8	56.4	-2.9	-38.3	4.2	24.0
F4	black	-484.8	63.0	17.6	46.5	1.9	-47.2	-3.9	23.3
A5	paper white	89.4	1.5	94.4	94.8	-0.1	-0.1	-3.9	-2.4
B5	skin highlight L*=89	17.4	17.0	83.2	92.2	14.0	-0.1	9.4	6.3
C5	skin highlight L*=75	7.9	30.0	70.1	86.5	20.7	-4.3	16.8	16.6
D5	skin shadow L*=25	-286.0	73.8	23.0	55.0	15.7	-41.6	6.8	40.6
E5	skin shadow L*=11	-404.7	56.9	15.4	45.2	4.4	-33.5	-0.9	29.4
F5	Max Black	100.0	11.6	5.2	16.8	-1.5	-1.4	-4.4	-4.0

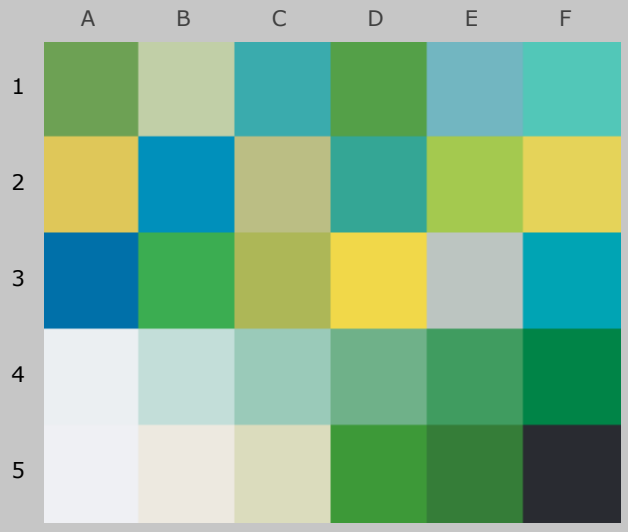
Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-40.4	36.7	36.1
Average Score for the Worst 10% (3 lowest scoring patches)	-403.6	-42.6	74.8



-42.9color/35.2tone



Original Print Colors
(measured before light exposure)



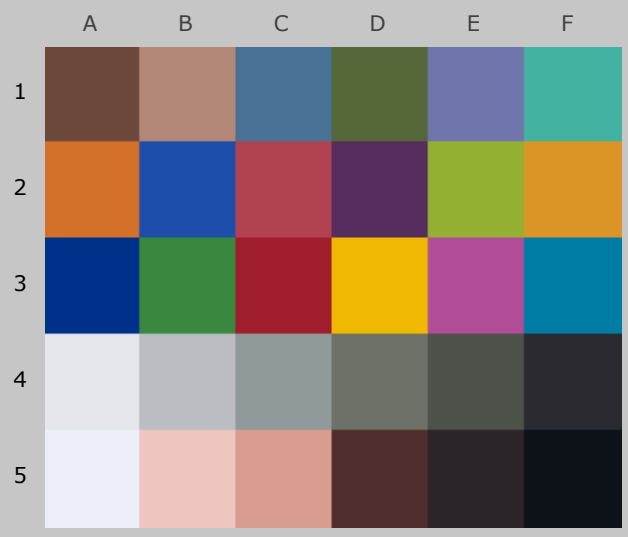
Colors after 100 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

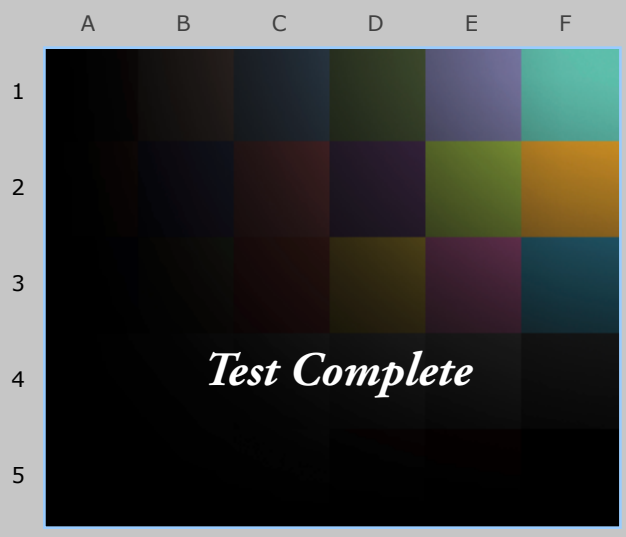
100 Mlux-hrs Light Exposure (i.e., after) Compared to Original Print Colors (i.e., before)

				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	-146.1	55.7	34.3	61.1	15.0	-28.7	12.6	34.4
B1	light Skin	-19.9	33.6	60.8	81.0	16.4	-10.2	14.7	18.4
C1	blue sky	-8.6	33.1	46.0	64.0	-7.0	-31.7	-24.2	-11.4
D1	foliage	-10.6	35.0	41.0	59.6	-12.6	-38.1	23.1	38.1
E1	blue flower	-3.4	37.7	50.6	69.6	7.5	-20.4	-30.1	-13.4
F1	bluish green	94.7	7.9	65.7	73.3	-35.8	-36.6	-0.8	-3.1
A2	orange	43.9	42.9	58.6	80.9	35.7	-0.8	53.6	57.0
B2	purplish blue	19.4	50.9	34.3	54.2	13.1	-28.2	-56.1	-33.9
C2	moderate red	-11.7	63.4	44.4	75.7	45.8	-8.0	17.0	29.0
D2	purple	-88.5	74.5	25.9	61.4	26.3	-35.8	-22.3	-1.5
E2	yellow green	94.8	9.4	68.0	76.6	-23.2	-25.9	57.3	54.8
F2	orange yellow	63.3	30.3	67.5	84.4	21.3	-3.7	63.8	60.9
A3	blue	24.3	48.4	21.9	41.1	14.9	-27.8	-56.0	-43.9
B3	green	73.0	18.0	50.6	62.6	-36.7	-48.4	30.7	37.3
C3	red	-16.4	78.6	35.6	72.1	52.7	-14.0	27.3	47.2
D3	yellow	78.7	20.0	78.3	86.5	11.2	-1.8	82.8	69.9
E3	magenta	-7.4	64.7	48.2	78.8	48.4	-4.1	-20.6	1.5
F3	cyan	52.3	22.9	47.3	59.9	-24.0	-40.7	-30.5	-21.3
A4	white	86.2	2.9	91.8	94.0	0.4	-1.4	-2.5	-2.1
B4	neutral 8	-4.7	14.3	76.4	86.2	0.0	-10.3	-3.2	-1.4
C4	neutral 6.5	-74.9	22.7	62.6	77.5	-2.8	-19.4	-1.7	2.7
D4	neutral 5	-187.2	34.2	47.1	67.0	-3.2	-29.4	4.7	13.8
E4	neutral 3.5	-328.5	47.6	33.8	57.5	-2.9	-39.4	4.2	23.4
F4	black	-497.0	64.5	17.6	47.5	1.9	-48.5	-3.9	23.3
A5	paper white	86.8	1.9	94.4	95.0	-0.1	-0.1	-3.9	-2.2
B5	skin highlight L*=89	16.0	17.4	83.2	92.7	14.0	-0.1	9.4	5.4
C5	skin highlight L*=75	7.6	30.4	70.1	87.2	20.7	-4.4	16.8	15.1
D5	skin shadow L*=25	-291.8	75.1	23.0	56.0	15.7	-42.7	6.8	40.7
E5	skin shadow L*=11	-421.3	58.9	15.4	46.5	4.4	-35.0	-0.9	30.0
F5	Max Black	89.8	12.6	5.2	17.7	-1.5	-0.1	-4.4	-3.9

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	-42.9	35.2	37.0
Average Score for the Worst 10% (3 lowest scoring patches)	-415.6	-46.0	76.1



Original Print Colors
(measured before light exposure)



No further updates

Epson 1270, Epson OEM Ink,
Epson Premium Glossy Photo Paper

Aardenburg Imaging
& Archives