Aardenburg

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IMAGING & ARCHIVES

Accelerated Light Fading Test Results

Epson 1270, Epson OEM Ink,
Epson Colorlife Photo Paper

Sample # AaI_20080422_SN002

100 Megalux-hours completed

Conservation Display Rating *	
Lower Exposure Limit (Megalux hours)	Upper Exposure limit (Megalux hours)
2	4

* 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.

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Test Print Prepared by: Aardenburg Imaging & Archives

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For more information please contact: info@aardenburg-imaging.com

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 Colorlife Photo Paper

Sample #: AaI_20080422_SN002
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, C = 7, Y = -7, M = -12"
Media Setting: Photo Quality Glossy Film

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

Profile: AaI_EPColorLife(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)	94.6	94.5	0.2	-1.2	-4.6	0.5
(1) ΔL*, Δa*, Δb* respectively	0.1		1.4		5.1	
(1) Calculated differences, especially for Δb*, indicate the role and magnitude of fluorescence on original paper color						
Maximum Printed black (UV included)	L* = 2.2		a* = 1.3		b* = -0.2	

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.

July 8, 2008 – 10 Megalux-hours: This sample is being adversely affected by large changes in deep shadow areas (see patches F4, D4, and D5). The three worst performing patches all had starting density values that are higher than current industry light fade test methods typically consider as part of the test methodology. The WIR 3.0 visually weighted criteria set used by Wilhelm Imaging Research, for example, utilizes four color patches nominally printed at 0. 6 density and four patches printed at 1.0 density. Patch D4 in this test sample started with L= 18 which would have been measured as a density greater than 1.5. Hence, the most significantly changed patches at 10 Megalux-hour exposure belong to an image area of higher density which does not get screened in other laboratory test protocols. Thus, limited color sample sets in accelerated aging tests can overlook some important changes that happen to real world prints. AaI&A considers the 30 patch set used in this test to be the minimum count necessary to adequately screen printer/ink/paper performance. Higher sample counts would be even better, but reduced patch counts allow for more samples to undergo at least some basic testing.

Epson ColorLife paper also employs a swellable polymer type image receiver coating layer. Swellable papers are prone to additional solvent evaporation/dye migration and humidity related issues that can cause what is often referred to as “short term drift”. Short term drift may also be a factor in this test result. A second sample from the same batch as this sample (which has now had much longer time in dark storage to “dry”) will be submitted to light fade testing to gather more data on this printer/ink/paper combination.

Epson Colorlife paper and the Epson 1270 printer are no longer commercially available. However, they represent an important benchmark in the history of inkjet photo printing, because the Colorlife paper was formulated to improve gas fade resistance of the OEM ink used in the Epson 1270 and 1280 series of inkjet printers. The OEM dye set for the Epson 1270/1280 series printers is still readily available.

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

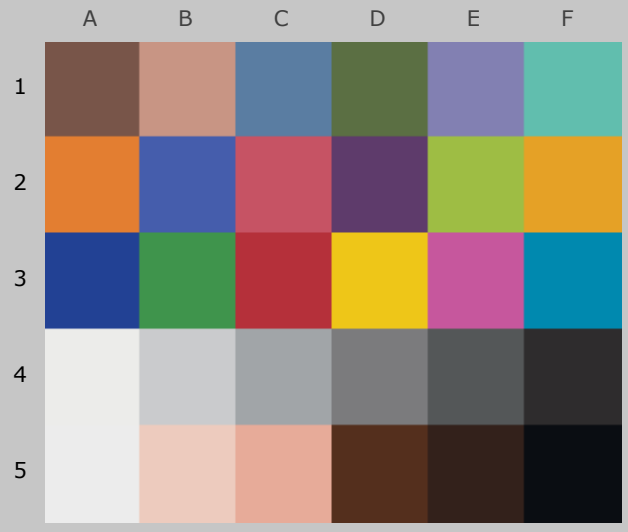
Light levels commonly encountered in the real world fluctuate widely throughout indoor print display environments and produce large variations in how long it takes for artwork to acquire light-induced damage. Use this table as a guide to estimate how many "years on display" (denoted in red text) it takes 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.

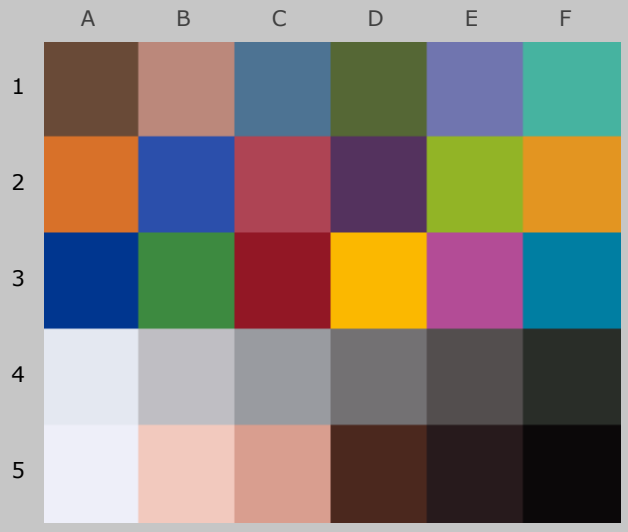
(1) Eastman Kodak has cited this exposure condition and 90% confidence limit as a rationale for estimating print fading times of traditional color photo materials in typical home display environments. For recent light fading claims regarding its line of pigment-based inkjet printers, Kodak has adopted 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)



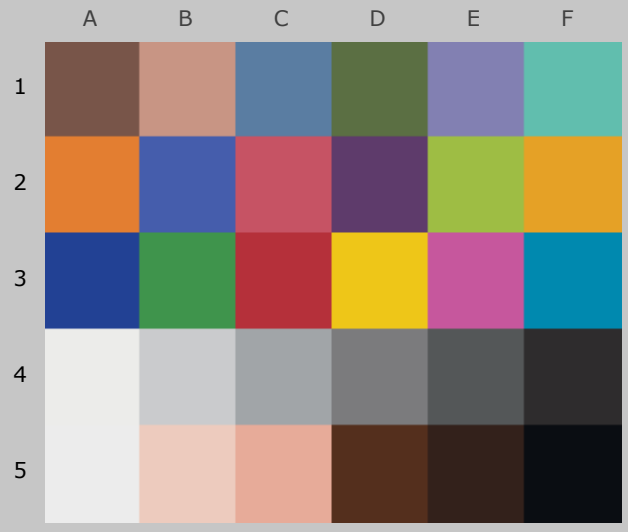
Colors at Zero Megalux-hours of Light Exposure
(same as original print colors)

Epson 1270, Epson OEM Ink, Epson Colorlife Photo Paper

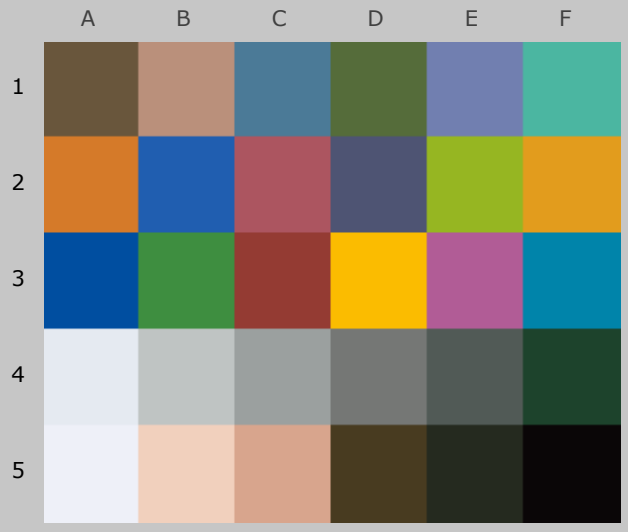
Original Print Colors as Measured and at Start of Test									
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	100	0.0	34.7		11.6		16.9	
B1	light Skin	100	0.0	61.4		18.7		14.8	
C1	blue sky	100	0.0	46.5		-6.9		-22.1	
D1	foliage	100	0.0	41.2		-13.7		25.6	
E1	blue flower	100	0.0	50.6		8.7		-31.8	
F1	bluish green	100	0.0	66.3		-35.6		-0.2	
A2	orange	100	0.0	59.4		37.9		55.9	
B2	purplish blue	100	0.0	35.2		12.7		-54.3	
C2	moderate red	100	0.0	44.5		45.2		14.3	
D2	purple	100	0.0	26.7		22.3		-19.8	
E2	yellow green	100	0.0	68.9		-25.5		61.9	
F2	orange yellow	100	0.0	68.6		24.0		67.2	
A3	blue	100	0.0	23.8		12.6		-55.6	
B3	green	100	0.0	51.4		-37.3		32.2	
C3	red	100	0.0	32.3		50.0		26.7	
D3	yellow	100	0.0	79.5		16.4		86.5	
E3	magenta	100	0.0	48.4		48.9		-19.7	
F3	cyan	100	0.0	47.9		-23.5		-29.5	
A4	white	100	0.0	91.8		0.0		-4.9	
B4	neutral 8	100	0.0	77.4		0.9		-2.4	
C4	neutral 6.5	100	0.0	63.8		0.5		-2.6	
D4	neutral 5	100	0.0	47.7		1.4		-1.2	
E4	neutral 3.5	100	0.0	33.9		1.7		1.4	
F4	black	100	0.0	18.0		-2.6		3.4	
A5	paper white	100	0.0	94.6		0.7		-4.7	
B5	skin highlight L*=89	100	0.0	84.3		14.1		10.7	
C5	skin highlight L*=75	100	0.0	70.6		21.4		17.1	
D5	skin shadow L*=25	100	0.0	20.6		16.1		14.1	
E5	skin shadow L*=11	100	0.0	10.9		6.7		1.1	
F5	Max Black	100	0.0	2.2		1.3		-0.2	

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

72.4color/86.5tone



Original Print Colors
(measured before light exposure)



Colors after 10 Megalux-hours
light exposure

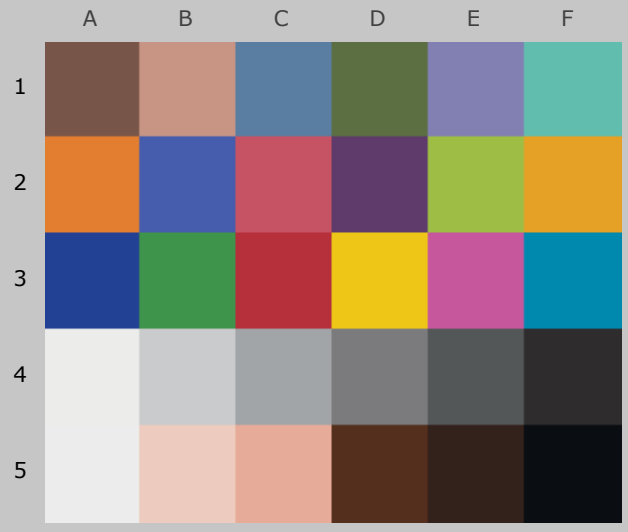
Epson 1270, Epson OEM Ink, Epson Colorlife Photo Paper

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

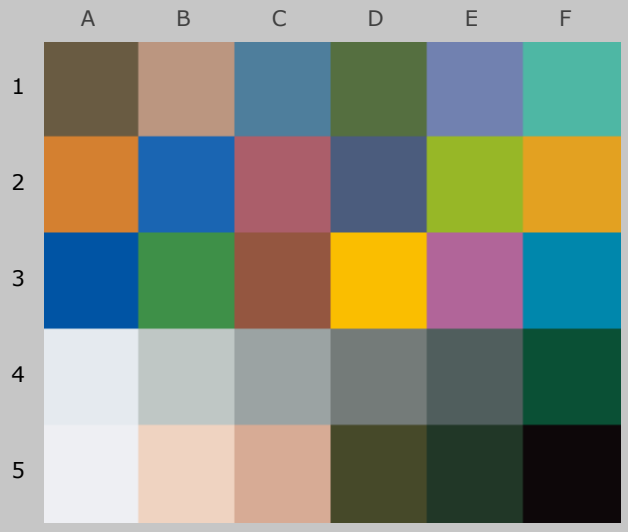
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	69.0	7.6	34.7	37.9	11.6	4.9	16.9	18.2
B1	light Skin	79.3	5.8	61.4	63.6	18.7	14.0	14.8	17.6
C1	blue sky	89.7	3.7	46.5	48.8	-6.9	-9.5	-22.1	-20.9
D1	foliage	94.1	2.7	41.2	42.9	-13.7	-15.9	25.6	25.3
E1	blue flower	84.6	6.1	50.6	53.2	8.7	4.5	-31.8	-28.2
F1	bluish green	96.8	1.9	66.3	67.3	-35.6	-35.9	-0.2	1.4
A2	orange	92.4	5.8	59.4	60.7	37.9	32.4	55.9	57.1
B2	purplish blue	83.4	10.6	35.2	39.5	12.7	3.9	-54.3	-50.3
C2	moderate red	82.9	9.1	44.5	47.4	45.2	37.3	14.3	10.9
D2	purple	39.3	20.9	26.7	36.2	22.3	3.7	-19.8	-19.1
E2	yellow green	97.9	2.1	68.9	69.8	-25.5	-25.2	61.9	63.8
F2	orange yellow	94.7	4.5	68.6	70.2	24.0	20.3	67.2	69.4
A3	blue	76.9	15.6	23.8	31.3	12.6	-1.0	-55.6	-53.8
B3	green	99.1	1.5	51.4	52.5	-37.3	-38.1	32.2	32.8
C3	red	78.8	13.7	32.3	37.8	50.0	37.6	26.7	25.4
D3	yellow	97.5	2.9	79.5	80.5	16.4	14.4	86.5	88.3
E3	magenta	83.8	9.4	48.4	51.1	48.9	40.9	-19.7	-15.6
F3	cyan	99.0	2.3	47.9	50.0	-23.5	-24.3	-29.5	-29.8
A4	white	88.7	1.7	91.8	92.4	0.0	-0.9	-4.9	-3.6
B4	neutral 8	64.8	4.1	77.4	78.7	0.9	-1.8	-2.4	0.3
C4	neutral 6.5	68.1	3.9	63.8	65.4	0.5	-1.9	-2.6	0.0
D4	neutral 5	69.3	4.0	47.7	49.7	1.4	-1.3	-1.2	1.0
E4	neutral 3.5	45.6	6.7	33.9	37.4	1.7	-4.0	1.4	1.1
F4	black	-76.3	18.6	18.0	25.1	-2.6	-18.7	3.4	9.6
A5	paper white	93.9	1.1	94.6	94.8	0.7	0.3	-4.7	-3.7
B5	skin highlight L*=89	72.3	5.6	84.3	85.8	14.1	9.7	10.7	13.9
C5	skin highlight L*=75	82.9	5.4	70.6	72.2	21.4	17.0	17.1	19.8
D5	skin shadow L*=25	38.9	14.6	20.6	26.0	16.1	3.4	14.1	18.9
E5	skin shadow L*=11	-15.2	12.6	10.9	16.1	6.7	-3.7	1.1	5.9
F5	Max Black	100.0	0.4	2.2	2.0	1.3	1.4	-0.2	0.1

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	72.4	86.5	6.8
Average Score for the Worst 10% (3 lowest scoring patches)	-17.5	67.8	18.4

58.9color/78.8tone



Original Print Colors
(measured before light exposure)



Colors after 20 Megalux-hours
light exposure

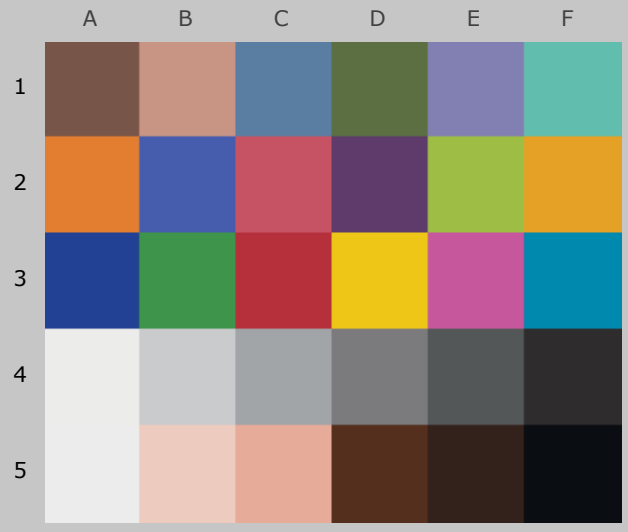
Epson 1270, Epson OEM Ink, Epson Colorlife Photo Paper

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

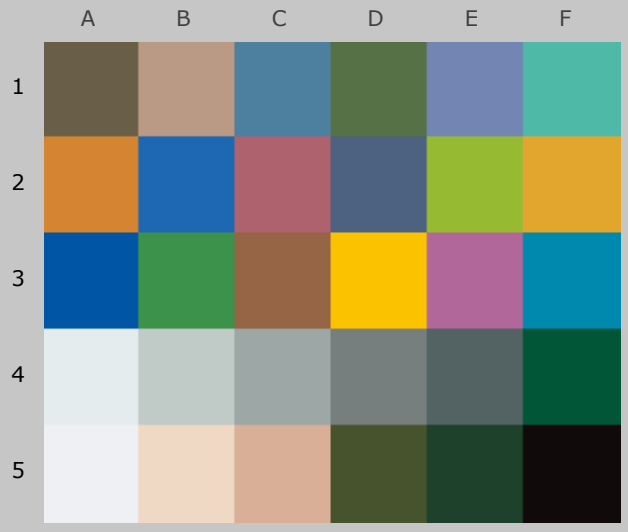
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	59.4	10.0	34.7	39.4	11.6	2.8	16.9	16.6
B1	light Skin	71.9	8.0	61.4	65.0	18.7	11.7	14.8	16.7
C1	blue sky	86.6	5.2	46.5	50.2	-6.9	-10.5	-22.1	-21.5
D1	foliage	87.7	4.9	41.2	43.9	-13.7	-16.9	25.6	23.1
E1	blue flower	78.7	8.4	50.6	54.3	8.7	2.7	-31.8	-27.3
F1	bluish green	100.0	1.7	66.3	68.0	-35.6	-35.5	-0.2	-0.2
A2	orange	87.9	9.1	59.4	62.2	37.9	29.2	55.9	55.5
B2	purplish blue	76.4	15.0	35.2	41.4	12.7	0.4	-54.3	-48.3
C2	moderate red	73.0	14.1	44.5	49.2	45.2	33.5	14.3	8.0
D2	purple	27.2	25.3	26.7	38.9	22.3	0.1	-19.8	-20.9
E2	yellow green	99.7	1.3	68.9	70.0	-25.5	-25.4	61.9	62.6
F2	orange yellow	91.6	7.0	68.6	71.2	24.0	17.7	67.2	68.7
A3	blue	70.8	19.6	23.8	33.3	12.6	-4.4	-55.6	-53.0
B3	green	96.9	2.8	51.4	53.3	-37.3	-38.4	32.2	30.4
C3	red	56.1	27.8	32.3	43.6	50.0	24.7	26.7	24.4
D3	yellow	96.4	3.9	79.5	80.9	16.4	12.8	86.5	87.0
E3	magenta	77.0	13.4	48.4	52.8	48.9	37.3	-19.7	-14.7
F3	cyan	97.6	3.5	47.9	51.1	-23.5	-24.7	-29.5	-30.1
A4	white	77.0	2.7	91.8	92.4	0.0	-1.4	-4.9	-2.6
B4	neutral 8	57.4	5.0	77.4	79.6	0.9	-3.1	-2.4	-0.1
C4	neutral 6.5	65.3	4.6	63.8	66.4	0.5	-3.1	-2.6	-1.3
D4	neutral 5	60.0	5.4	47.7	51.0	1.4	-2.9	-1.2	-0.3
E4	neutral 3.5	20.2	9.6	33.9	39.0	1.7	-6.0	1.4	-1.2
F4	black	-162.9	27.8	18.0	29.3	-2.6	-27.2	3.4	10.2
A5	paper white	81.4	2.3	94.6	94.6	0.7	0.1	-4.7	-2.5
B5	skin highlight L*=89	64.9	7.2	84.3	86.8	14.1	7.7	10.7	12.8
C5	skin highlight L*=75	75.5	7.8	70.6	73.6	21.4	14.3	17.1	18.2
D5	skin shadow L*=25	-3.6	24.7	20.6	30.3	16.1	-5.9	14.1	19.4
E5	skin shadow L*=11	-102.6	22.0	10.9	20.7	6.7	-12.3	1.1	6.6
F5	Max Black	100.0	0.5	2.2	2.3	1.3	1.7	-0.2	0.1

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	58.9	78.8	10.0
Average Score for the Worst 10% (3 lowest scoring patches)	-89.7	51.6	27.0

50.7 color / 74.3 tone



Original Print Colors
(measured before light exposure)



Colors after 30 Megalux-hours
light exposure

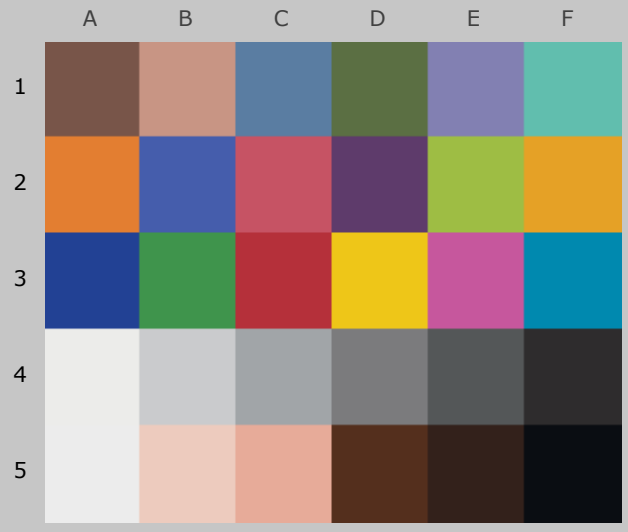
Epson 1270, Epson OEM Ink, Epson Colorlife Photo Paper

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

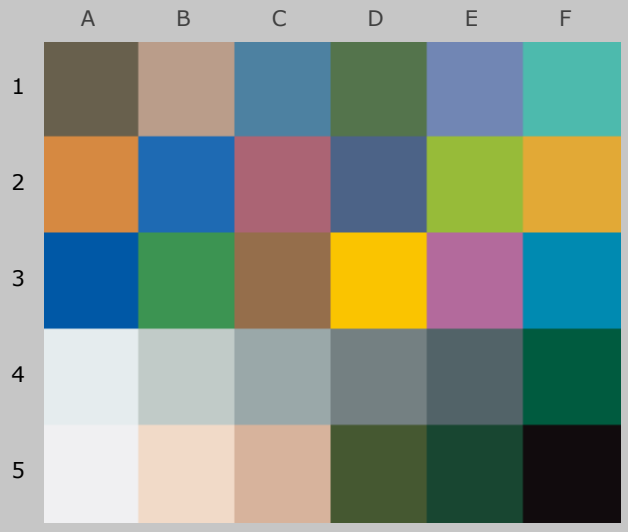
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	54.1	11.4	34.7	40.4	11.6	2.0	16.9	14.4
B1	light Skin	66.7	9.7	61.4	66.2	18.7	10.3	14.8	15.7
C1	blue sky	84.8	6.0	46.5	51.0	-6.9	-10.9	-22.1	-21.8
D1	foliage	81.3	6.9	41.2	44.9	-13.7	-17.4	25.6	21.0
E1	blue flower	74.5	10.0	50.6	55.2	8.7	1.5	-31.8	-26.6
F1	bluish green	100.0	2.2	66.3	68.5	-35.6	-35.5	-0.2	-0.7
A2	orange	85.0	11.3	59.4	63.3	37.9	27.2	55.9	55.7
B2	purplish blue	72.9	17.2	35.2	42.6	12.7	-1.1	-54.3	-47.0
C2	moderate red	69.1	16.3	44.5	50.5	45.2	31.9	14.3	7.1
D2	purple	24.2	26.8	26.7	40.4	22.3	-0.7	-19.8	-21.1
E2	yellow green	97.2	3.1	68.9	71.0	-25.5	-26.2	61.9	59.7
F2	orange yellow	88.4	9.6	68.6	72.6	24.0	15.3	67.2	66.0
A3	blue	68.3	21.3	23.8	34.3	12.6	-5.7	-55.6	-52.3
B3	green	94.8	4.2	51.4	54.3	-37.3	-38.9	32.2	29.5
C3	red	43.2	36.1	32.3	47.6	50.0	17.3	26.7	26.4
D3	yellow	93.7	6.5	79.5	82.0	16.4	10.7	86.5	84.5
E3	magenta	73.5	15.5	48.4	53.9	48.9	35.7	-19.7	-13.8
F3	cyan	96.9	4.3	47.9	51.9	-23.5	-24.9	-29.5	-30.4
A4	white	70.8	3.4	91.8	92.8	0.0	-1.6	-4.9	-2.1
B4	neutral 8	49.2	6.1	77.4	80.5	0.9	-3.9	-2.4	0.0
C4	neutral 6.5	55.5	5.9	63.8	67.4	0.5	-4.1	-2.6	-1.3
D4	neutral 5	54.2	6.6	47.7	52.1	1.4	-3.5	-1.2	-1.4
E4	neutral 3.5	10.6	11.0	33.9	40.2	1.7	-6.5	1.4	-2.3
F4	black	-196.5	31.8	18.0	31.7	-2.6	-30.3	3.4	11.0
A5	paper white	73.4	3.0	94.6	94.9	0.7	-0.1	-4.7	-1.8
B5	skin highlight L*=89	58.2	8.7	84.3	88.0	14.1	6.4	10.7	12.6
C5	skin highlight L*=75	69.3	10.0	70.6	75.0	21.4	12.6	17.1	18.2
D5	skin shadow L*=25	-26.5	30.3	20.6	33.2	16.1	-10.6	14.1	21.1
E5	skin shadow L*=11	-164.4	28.8	10.9	24.1	6.7	-17.8	1.1	8.8
F5	Max Black	97.3	1.1	2.2	3.0	1.3	2.0	-0.2	0.1

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	50.7	74.3	12.2
Average Score for the Worst 10% (3 lowest scoring patches)	-129.2	39.1	32.7

45.1 color / 71.5 tone



Original Print Colors
(measured before light exposure)



Colors after 40 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink, Epson Colorlife 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	46.4	13.1	34.7	41.0	11.6	1.4	16.9	11.5
B1	light Skin	62.8	10.9	61.4	67.1	18.7	9.3	14.8	14.1
C1	blue sky	84.4	6.5	46.5	51.5	-6.9	-11.0	-22.1	-22.9
D1	foliage	72.0	9.6	41.2	45.5	-13.7	-17.8	25.6	18.0
E1	blue flower	72.8	10.8	50.6	55.7	8.7	0.9	-31.8	-26.5
F1	bluish green	93.8	3.7	66.3	68.9	-35.6	-34.9	-0.2	-2.8
A2	orange	80.8	14.3	59.4	64.1	37.9	25.6	55.9	50.4
B2	purplish blue	70.9	18.5	35.2	43.1	12.7	-2.0	-54.3	-46.3
C2	moderate red	64.5	18.5	44.5	51.1	45.2	31.4	14.3	3.9
D2	purple	23.9	27.3	26.7	41.2	22.3	-0.7	-19.8	-22.9
E2	yellow green	94.4	4.9	68.9	71.3	-25.5	-26.2	61.9	57.7
F2	orange yellow	85.7	11.8	68.6	73.5	24.0	13.7	67.2	64.3
A3	blue	67.0	22.2	23.8	34.7	12.6	-6.4	-55.6	-51.9
B3	green	89.7	6.5	51.4	54.8	-37.3	-39.0	32.2	26.9
C3	red	35.8	40.9	32.3	50.0	50.0	13.2	26.7	25.6
D3	yellow	91.7	8.4	79.5	82.5	16.4	9.5	86.5	82.8
E3	magenta	71.5	16.7	48.4	54.4	48.9	34.5	-19.7	-13.7
F3	cyan	95.7	4.9	47.9	52.3	-23.5	-24.7	-29.5	-31.2
A4	white	67.9	3.7	91.8	92.8	0.0	-1.7	-4.9	-1.8
B4	neutral 8	46.7	6.6	77.4	80.9	0.9	-4.3	-2.4	-0.5
C4	neutral 6.5	51.9	6.5	63.8	67.9	0.5	-4.6	-2.6	-2.1
D4	neutral 5	48.0	7.4	47.7	52.6	1.4	-3.8	-1.2	-2.9
E4	neutral 3.5	-2.0	12.3	33.9	40.9	1.7	-6.5	1.4	-4.7
F4	black	-213.1	33.8	18.0	33.2	-2.6	-32.3	3.4	9.5
A5	paper white	68.9	3.5	94.6	94.9	0.7	-0.2	-4.7	-1.3
B5	skin highlight L*=89	54.6	9.5	84.3	88.5	14.1	5.6	10.7	11.7
C5	skin highlight L*=75	65.3	11.3	70.6	75.8	21.4	11.4	17.1	17.2
D5	skin shadow L*=25	-36.8	32.9	20.6	34.7	16.1	-13.1	14.1	20.0
E5	skin shadow L*=11	-196.8	32.6	10.9	26.4	6.7	-21.1	1.1	8.3
F5	Max Black	95.6	1.5	2.2	3.3	1.3	2.2	-0.2	0.1

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	45.1	71.5	13.7
Average Score for the Worst 10% (3 lowest scoring patches)	-148.9	31.5	35.9



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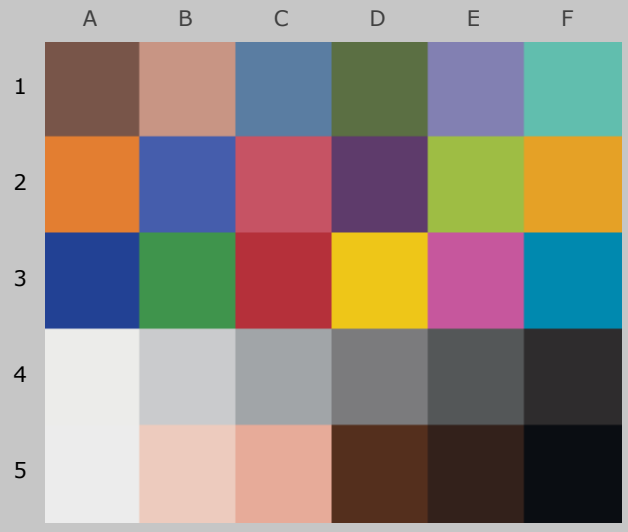
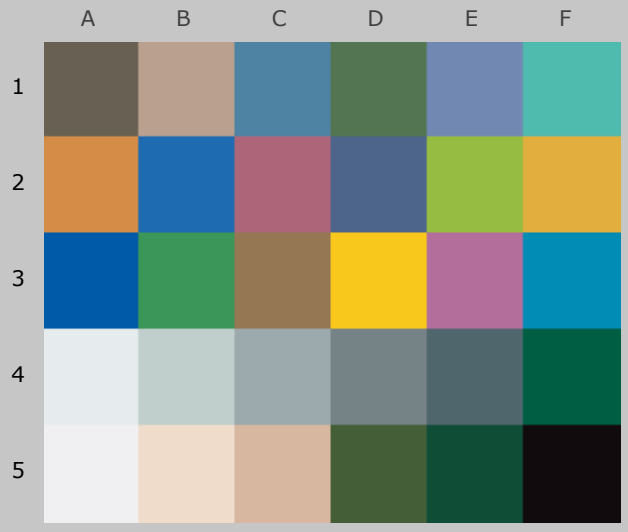
38.7 color / 68.4 tone



Original Print Colors
(measured before light exposure)



Colors after 50 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink, Epson Colorlife 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	39.0	14.7	34.7	41.6	11.6	0.9	16.9	9.5
B1	light Skin	58.2	12.3	61.4	67.9	18.7	8.4	14.8	12.8
C1	blue sky	83.1	7.0	46.5	52.0	-6.9	-11.1	-22.1	-23.5
D1	foliage	64.3	11.9	41.2	46.0	-13.7	-18.1	25.6	15.6
E1	blue flower	70.6	11.7	50.6	56.3	8.7	0.2	-31.8	-26.3
F1	bluish green	89.6	5.1	66.3	69.2	-35.6	-34.4	-0.2	-4.3
A2	orange	77.1	17.0	59.4	65.1	37.9	23.9	55.9	48.1
B2	purplish blue	68.7	19.8	35.2	43.6	12.7	-2.9	-54.3	-45.4
C2	moderate red	60.9	20.4	44.5	51.8	45.2	30.5	14.3	2.2
D2	purple	23.3	27.9	26.7	42.0	22.3	-0.7	-19.8	-24.1
E2	yellow green	90.1	7.7	68.9	71.9	-25.5	-26.3	61.9	54.8
F2	orange yellow	82.2	14.5	68.6	74.6	24.0	11.9	67.2	61.9
A3	blue	65.3	23.3	23.8	35.3	12.6	-7.3	-55.6	-51.5
B3	green	84.0	9.4	51.4	55.6	-37.3	-38.9	32.2	23.9
C3	red	28.2	45.8	32.3	52.5	50.0	8.9	26.7	23.9
D3	yellow	88.6	11.1	79.5	83.2	16.4	8.2	86.5	80.0
E3	magenta	69.2	18.0	48.4	55.1	48.9	33.4	-19.7	-13.4
F3	cyan	94.4	5.6	47.9	52.8	-23.5	-24.6	-29.5	-31.8
A4	white	64.2	4.1	91.8	93.0	0.0	-1.8	-4.9	-1.5
B4	neutral 8	43.4	7.2	77.4	81.5	0.9	-4.8	-2.4	-0.8
C4	neutral 6.5	46.0	7.4	63.8	68.6	0.5	-5.2	-2.6	-2.7
D4	neutral 5	38.5	8.6	47.7	53.4	1.4	-4.3	-1.2	-4.0
E4	neutral 3.5	-16.2	13.8	33.9	41.6	1.7	-6.6	1.4	-6.6
F4	black	-232.3	36.1	18.0	34.7	-2.6	-34.3	3.4	8.5
A5	paper white	62.8	4.0	94.6	94.9	0.7	-0.2	-4.7	-0.7
B5	skin highlight L*=89	50.2	10.5	84.3	89.2	14.1	4.8	10.7	11.0
C5	skin highlight L*=75	59.5	13.2	70.6	77.0	21.4	9.8	17.1	16.4
D5	skin shadow L*=25	-52.0	36.7	20.6	36.8	16.1	-16.5	14.1	19.3
E5	skin shadow L*=11	-232.9	36.8	10.9	28.8	6.7	-24.7	1.1	7.8
F5	Max Black	92.5	1.7	2.2	3.4	1.3	2.4	-0.2	0.3

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	38.7	68.4	15.5
Average Score for the Worst 10% (3 lowest scoring patches)	-172.4	22.9	39.8



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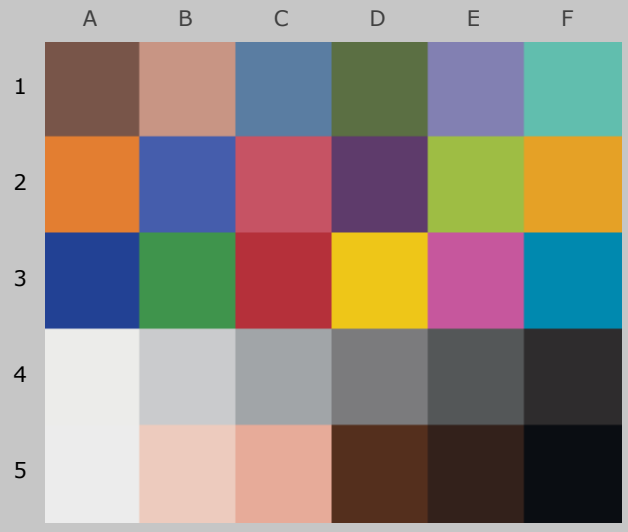
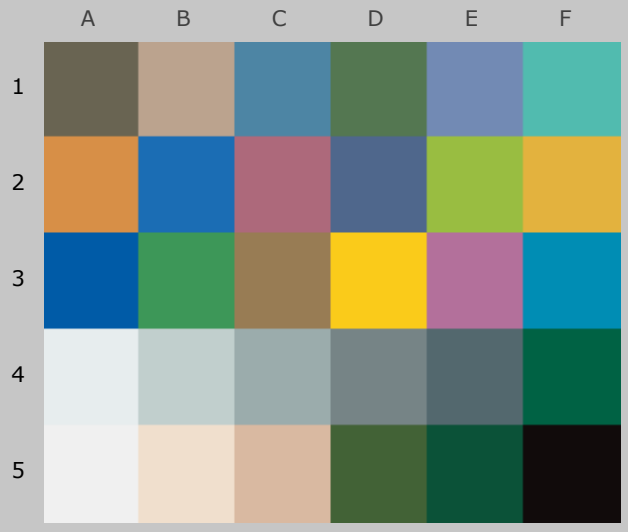
35.2color/66.3tone



Original Print Colors
(measured before light exposure)



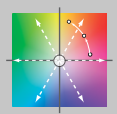
Colors after 60 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink, Epson Colorlife 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	38.8	15.0	34.7	42.2	11.6	0.2	16.9	10.6
B1	light Skin	54.5	13.5	61.4	68.7	18.7	7.4	14.8	13.8
C1	blue sky	81.2	7.7	46.5	52.6	-6.9	-11.7	-22.1	-22.9
D1	foliage	66.7	11.5	41.2	46.6	-13.7	-18.7	25.6	16.7
E1	blue flower	67.4	12.8	50.6	56.8	8.7	-0.6	-31.8	-25.5
F1	bluish green	90.5	5.0	66.3	69.5	-35.6	-34.5	-0.2	-3.9
A2	orange	76.2	17.9	59.4	66.1	37.9	22.6	55.9	49.4
B2	purplish blue	66.7	21.0	35.2	44.1	12.7	-3.8	-54.3	-44.6
C2	moderate red	60.0	21.1	44.5	52.5	45.2	29.7	14.3	2.5
D2	purple	22.2	28.5	26.7	42.6	22.3	-1.1	-19.8	-23.8
E2	yellow green	91.5	7.1	68.9	72.2	-25.5	-26.2	61.9	55.8
F2	orange yellow	81.0	15.7	68.6	75.6	24.0	10.5	67.2	63.3
A3	blue	63.6	24.3	23.8	35.7	12.6	-8.1	-55.6	-51.0
B3	green	86.0	8.7	51.4	56.0	-37.3	-39.4	32.2	25.0
C3	red	24.2	48.6	32.3	54.0	50.0	6.6	26.7	25.8
D3	yellow	88.1	11.8	79.5	83.8	16.4	7.2	86.5	80.6
E3	magenta	66.5	19.6	48.4	55.9	48.9	32.3	-19.7	-12.4
F3	cyan	94.9	5.8	47.9	53.2	-23.5	-25.0	-29.5	-31.3
A4	white	61.0	4.4	91.8	93.2	0.0	-1.9	-4.9	-1.2
B4	neutral 8	37.2	7.9	77.4	82.0	0.9	-5.3	-2.4	-0.6
C4	neutral 6.5	37.8	8.4	63.8	69.2	0.5	-5.9	-2.6	-2.2
D4	neutral 5	32.8	9.4	47.7	54.1	1.4	-5.1	-1.2	-3.5
E4	neutral 3.5	-18.3	14.4	33.9	42.2	1.7	-7.2	1.4	-6.2
F4	black	-245.3	37.6	18.0	35.5	-2.6	-35.4	3.4	9.5
A5	paper white	58.9	4.4	94.6	95.0	0.7	-0.3	-4.7	-0.4
B5	skin highlight L*=89	46.6	11.3	84.3	89.7	14.1	4.1	10.7	10.9
C5	skin highlight L*=75	55.4	14.6	70.6	77.8	21.4	8.7	17.1	17.0
D5	skin shadow L*=25	-63.2	39.5	20.6	38.1	16.1	-18.7	14.1	20.8
E5	skin shadow L*=11	-257.3	39.4	10.9	30.1	6.7	-26.8	1.1	9.3
F5	Max Black	90.4	2.0	2.2	3.7	1.3	2.5	-0.2	0.6

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	35.2	66.3	16.3
Average Score for the Worst 10% (3 lowest scoring patches)	-188.6	18.4	42.5



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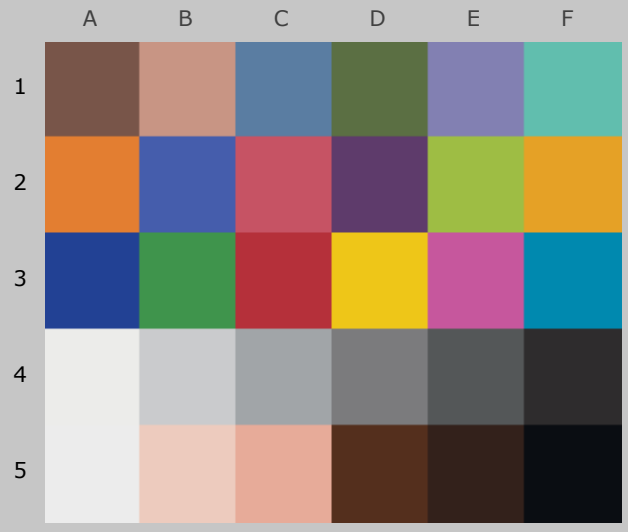
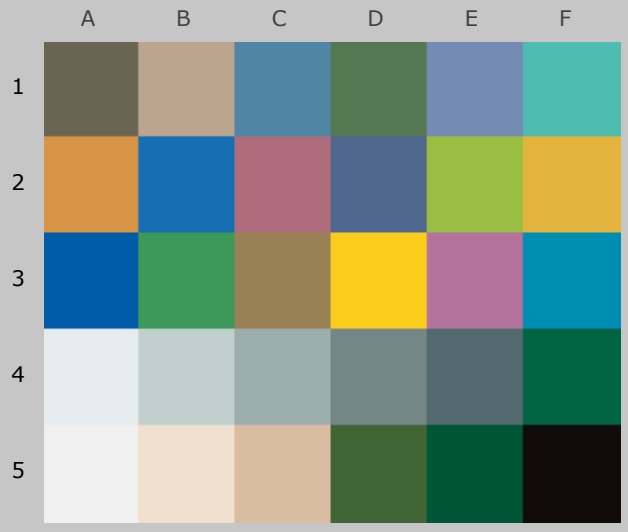
31.0$_{color}$/64.4$_{tone}$



Original Print Colors
(measured before light exposure)



Colors after 70 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink, Epson Colorlife 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	37.4	15.5	34.7	42.7	11.6	-0.6	16.9	11.4
B1	light Skin	50.8	14.6	61.4	69.5	18.7	6.5	14.8	14.5
C1	blue sky	78.8	8.4	46.5	52.9	-6.9	-12.3	-22.1	-22.4
D1	foliage	67.1	11.6	41.2	47.0	-13.7	-19.3	25.6	17.3
E1	blue flower	64.2	14.0	50.6	57.2	8.7	-1.3	-31.8	-24.7
F1	bluish green	91.2	5.0	66.3	69.8	-35.6	-34.6	-0.2	-3.7
A2	orange	75.0	19.0	59.4	67.0	37.9	21.3	55.9	50.5
B2	purplish blue	64.9	22.1	35.2	44.4	12.7	-4.5	-54.3	-44.0
C2	moderate red	59.3	21.6	44.5	53.1	45.2	29.2	14.3	2.7
D2	purple	21.1	29.1	26.7	43.1	22.3	-1.4	-19.8	-23.6
E2	yellow green	92.3	6.8	68.9	72.6	-25.5	-26.2	61.9	56.3
F2	orange yellow	79.5	17.1	68.6	76.4	24.0	9.1	67.2	64.4
A3	blue	62.1	25.2	23.8	35.9	12.6	-9.0	-55.6	-50.6
B3	green	86.7	8.7	51.4	56.5	-37.3	-39.8	32.2	25.6
C3	red	20.3	51.2	32.3	55.4	50.0	4.4	26.7	27.0
D3	yellow	87.6	12.4	79.5	84.3	16.4	6.2	86.5	81.3
E3	magenta	64.3	21.0	48.4	56.5	48.9	31.4	-19.7	-11.4
F3	cyan	94.5	6.2	47.9	53.5	-23.5	-25.5	-29.5	-31.1
A4	white	59.1	4.6	91.8	93.3	0.0	-1.9	-4.9	-1.0
B4	neutral 8	32.2	8.6	77.4	82.4	0.9	-5.7	-2.4	-0.3
C4	neutral 6.5	29.6	9.3	63.8	69.7	0.5	-6.6	-2.6	-1.4
D4	neutral 5	27.7	10.2	47.7	54.7	1.4	-5.8	-1.2	-2.8
E4	neutral 3.5	-20.2	14.8	33.9	42.7	1.7	-7.8	1.4	-5.8
F4	black	-268.3	39.9	18.0	36.4	-2.6	-37.3	3.4	10.8
A5	paper white	56.4	4.7	94.6	95.0	0.7	-0.3	-4.7	-0.1
B5	skin highlight L*=89	43.5	12.0	84.3	90.1	14.1	3.6	10.7	10.9
C5	skin highlight L*=75	51.4	15.9	70.6	78.5	21.4	7.6	17.1	17.8
D5	skin shadow L*=25	-75.3	42.4	20.6	39.3	16.1	-20.9	14.1	22.7
E5	skin shadow L*=11	-292.0	43.0	10.9	31.4	6.7	-29.7	1.1	11.1
F5	Max Black	90.1	1.8	2.2	3.2	1.3	2.4	-0.2	0.8

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	31.0	64.4	17.2
Average Score for the Worst 10% (3 lowest scoring patches)	-211.9	13.8	45.5



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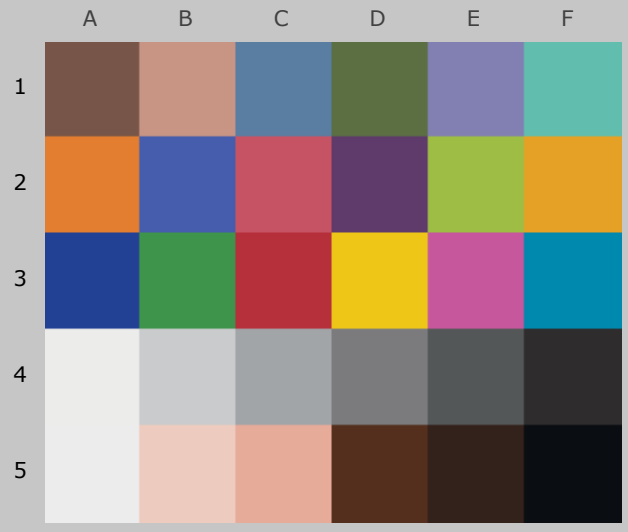
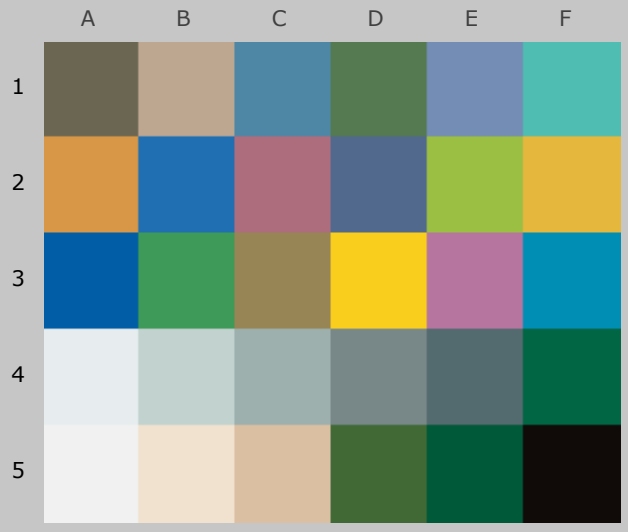
27.6color/62.9tone



Original Print Colors
(measured before light exposure)



Colors after 80 Megalux-hours
light exposure

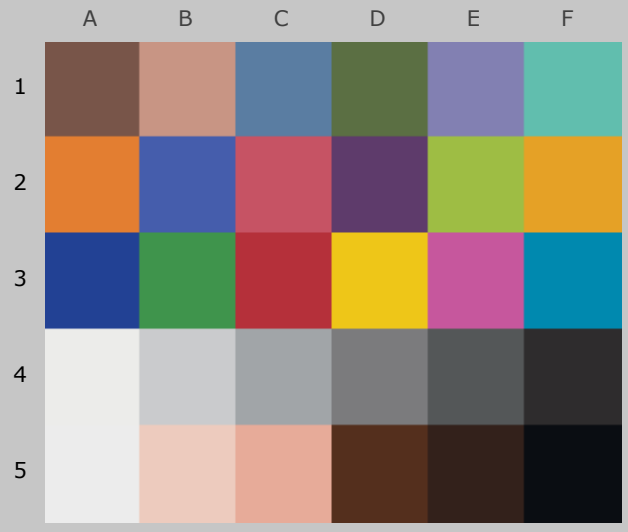
Epson 1270, Epson OEM Ink, Epson Colorlife Photo Paper

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

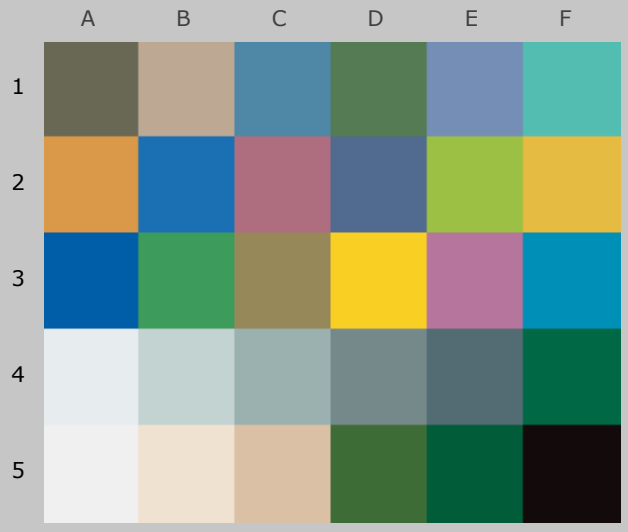
				L*		a*		b*	
Column/row	Color Patch	I*Color	ΔE	Before	After	Before	After	Before	After
A1	dark Skin	35.5	16.2	34.7	43.3	11.6	-1.3	16.9	12.1
B1	light Skin	47.4	15.7	61.4	70.3	18.7	5.6	14.8	15.0
C1	blue sky	76.4	9.2	46.5	53.5	-6.9	-12.9	-22.1	-22.0
D1	foliage	67.4	11.8	41.2	47.6	-13.7	-19.9	25.6	17.8
E1	blue flower	61.6	15.0	50.6	57.8	8.7	-2.0	-31.8	-24.1
F1	bluish green	91.8	5.2	66.3	70.2	-35.6	-34.7	-0.2	-3.5
A2	orange	73.7	20.2	59.4	67.9	37.9	20.2	55.9	51.3
B2	purplish blue	63.2	23.1	35.2	44.9	12.7	-5.3	-54.3	-43.3
C2	moderate red	58.4	22.3	44.5	53.8	45.2	28.5	14.3	2.9
D2	purple	19.7	29.7	26.7	43.6	22.3	-1.9	-19.8	-23.3
E2	yellow green	92.5	6.9	68.9	73.1	-25.5	-26.2	61.9	56.5
F2	orange yellow	78.0	18.4	68.6	77.3	24.0	7.9	67.2	64.9
A3	blue	60.5	26.2	23.8	36.3	12.6	-9.8	-55.6	-50.1
B3	green	86.9	8.9	51.4	57.0	-37.3	-40.1	32.2	25.8
C3	red	17.0	53.4	32.3	56.7	50.0	2.5	26.7	27.9
D3	yellow	86.7	13.3	79.5	84.8	16.4	5.4	86.5	81.1
E3	magenta	62.3	22.2	48.4	57.1	48.9	30.6	-19.7	-10.8
F3	cyan	94.0	6.6	47.9	53.9	-23.5	-25.9	-29.5	-30.8
A4	white	57.0	4.9	91.8	93.5	0.0	-1.9	-4.9	-0.8
B4	neutral 8	28.5	9.1	77.4	82.9	0.9	-6.1	-2.4	-0.2
C4	neutral 6.5	22.8	10.1	63.8	70.2	0.5	-7.2	-2.6	-1.1
D4	neutral 5	21.7	10.9	47.7	55.2	1.4	-6.5	-1.2	-2.3
E4	neutral 3.5	-23.1	15.3	33.9	43.1	1.7	-8.3	1.4	-5.6
F4	black	-281.1	41.4	18.0	37.1	-2.6	-38.4	3.4	11.5
A5	paper white	53.5	4.9	94.6	95.1	0.7	-0.3	-4.7	0.1
B5	skin highlight L*=89	41.0	12.6	84.3	90.5	14.1	3.1	10.7	10.6
C5	skin highlight L*=75	48.0	17.1	70.6	79.2	21.4	6.7	17.1	18.0
D5	skin shadow L*=25	-86.1	44.9	20.6	40.5	16.1	-23.0	14.1	23.9
E5	skin shadow L*=11	-314.2	45.4	10.9	32.6	6.7	-31.6	1.1	12.2
F5	Max Black	87.3	2.0	2.2	3.2	1.3	2.4	-0.2	1.1

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	27.6	62.9	18.1
Average Score for the Worst 10% (3 lowest scoring patches)	-227.1	10.4	47.9

25.1 color / 61.8 tone



Original Print Colors
(measured before light exposure)



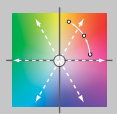
Colors after 90 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink, Epson Colorlife 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	32.3	16.9	34.7	43.7	11.6	-1.6	16.9	11.3
B1	light Skin	44.7	16.5	61.4	70.7	18.7	5.0	14.8	14.4
C1	blue sky	75.9	9.5	46.5	53.8	-6.9	-13.0	-22.1	-22.4
D1	foliage	64.7	12.7	41.2	48.0	-13.7	-20.2	25.6	17.0
E1	blue flower	60.6	15.3	50.6	57.9	8.7	-2.3	-31.8	-24.0
F1	bluish green	89.0	5.9	66.3	70.3	-35.6	-34.3	-0.2	-4.4
A2	orange	71.8	21.6	59.4	68.5	37.9	19.0	55.9	50.6
B2	purplish blue	61.8	23.9	35.2	45.1	12.7	-5.8	-54.3	-42.8
C2	moderate red	56.6	23.2	44.5	54.1	45.2	27.9	14.3	2.2
D2	purple	19.7	29.8	26.7	43.8	22.3	-1.8	-19.8	-23.6
E2	yellow green	91.3	7.7	68.9	73.2	-25.5	-26.0	61.9	55.6
F2	orange yellow	76.3	19.8	68.6	77.9	24.0	6.8	67.2	64.4
A3	blue	59.7	26.6	23.8	36.4	12.6	-10.2	-55.6	-49.8
B3	green	85.4	9.7	51.4	57.2	-37.3	-40.2	32.2	25.0
C3	red	14.7	54.9	32.3	57.4	50.0	1.2	26.7	27.3
D3	yellow	85.3	14.5	79.5	85.0	16.4	4.7	86.5	80.0
E3	magenta	60.7	23.1	48.4	57.5	48.9	29.8	-19.7	-10.5
F3	cyan	93.8	6.7	47.9	54.0	-23.5	-25.9	-29.5	-30.9
A4	white	59.6	4.6	91.8	93.4	0.0	-1.9	-4.9	-1.0
B4	neutral 8	28.5	9.3	77.4	83.1	0.9	-6.2	-2.4	-0.6
C4	neutral 6.5	20.6	10.5	63.8	70.5	0.5	-7.5	-2.6	-1.7
D4	neutral 5	16.9	11.5	47.7	55.6	1.4	-6.9	-1.2	-2.9
E4	neutral 3.5	-29.9	16.0	33.9	43.4	1.7	-8.4	1.4	-6.5
F4	black	-285.9	42.0	18.0	37.6	-2.6	-38.9	3.4	11.3
A5	paper white	56.8	4.6	94.6	95.0	0.7	-0.3	-4.7	-0.2
B5	skin highlight L*=89	38.9	13.0	84.3	90.7	14.1	2.8	10.7	9.8
C5	skin highlight L*=75	45.5	17.9	70.6	79.6	21.4	6.0	17.1	17.4
D5	skin shadow L*=25	-93.8	46.8	20.6	41.3	16.1	-24.6	14.1	24.3
E5	skin shadow L*=11	-334.7	47.6	10.9	33.7	6.7	-33.5	1.1	12.8
F5	Max Black	85.0	2.3	2.2	3.4	1.3	2.5	-0.2	1.3

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	25.1	61.8	18.8
Average Score for the Worst 10% (3 lowest scoring patches)	-238.1	8.4	49.8



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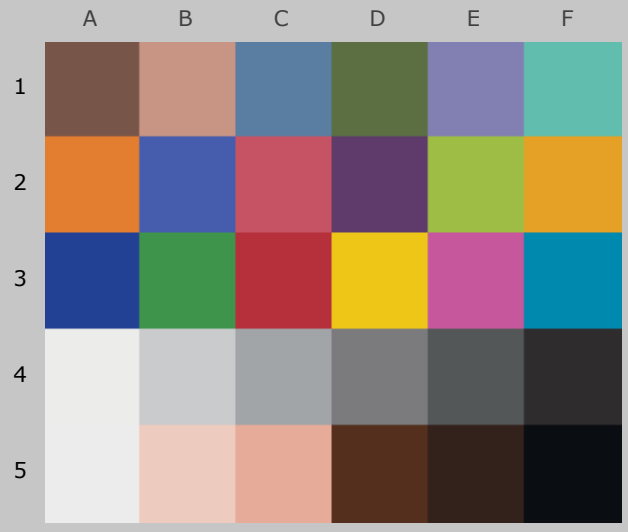
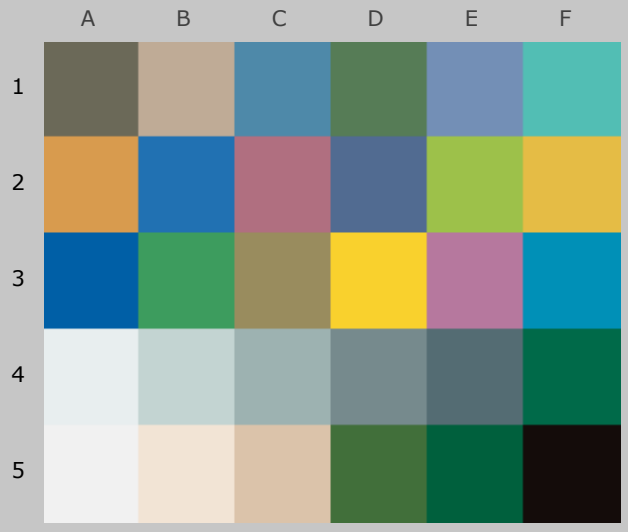
22.8color/60.6tone



Original Print Colors
(measured before light exposure)



Colors after 100 Megalux-hours
light exposure

Epson 1270, Epson OEM Ink,
Epson Colorlife 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	28.9	17.8	34.7	44.1	11.6	-1.9	16.9	10.2
B1	light Skin	42.6	17.3	61.4	71.3	18.7	4.6	14.8	13.5
C1	blue sky	75.4	9.8	46.5	54.1	-6.9	-13.1	-22.1	-22.5
D1	foliage	60.4	14.0	41.2	48.4	-13.7	-20.3	25.6	15.6
E1	blue flower	59.3	16.0	50.6	58.4	8.7	-2.8	-31.8	-23.9
F1	bluish green	86.1	6.9	66.3	70.6	-35.6	-33.9	-0.2	-5.4
A2	orange	69.9	23.0	59.4	69.2	37.9	18.2	55.9	49.2
B2	purplish blue	60.6	24.7	35.2	45.4	12.7	-6.3	-54.3	-42.3
C2	moderate red	55.2	24.0	44.5	54.6	45.2	27.6	14.3	1.5
D2	purple	19.1	30.3	26.7	44.4	22.3	-1.9	-19.8	-24.1
E2	yellow green	88.3	9.6	68.9	73.7	-25.5	-25.9	61.9	53.6
F2	orange yellow	74.5	21.2	68.6	78.6	24.0	5.9	67.2	62.6
A3	blue	58.6	27.3	23.8	36.7	12.6	-10.7	-55.6	-49.4
B3	green	82.6	11.1	51.4	57.7	-37.3	-40.1	32.2	23.5
C3	red	12.8	56.3	32.3	58.4	50.0	0.1	26.7	26.3
D3	yellow	83.5	16.2	79.5	85.5	16.4	4.0	86.5	77.9
E3	magenta	59.6	23.8	48.4	58.0	48.9	29.2	-19.7	-10.3
F3	cyan	93.4	7.1	47.9	54.4	-23.5	-25.9	-29.5	-31.2
A4	white	60.2	4.7	91.8	93.8	0.0	-1.9	-4.9	-1.1
B4	neutral 8	29.2	9.6	77.4	83.7	0.9	-6.2	-2.4	-1.1
C4	neutral 6.5	19.4	10.9	63.8	71.1	0.5	-7.7	-2.6	-2.4
D4	neutral 5	13.7	12.1	47.7	56.2	1.4	-7.0	-1.2	-3.6
E4	neutral 3.5	-35.8	16.8	33.9	44.0	1.7	-8.4	1.4	-7.4
F4	black	-287.7	42.5	18.0	38.4	-2.6	-39.3	3.4	10.4
A5	paper white	55.8	4.8	94.6	95.4	0.7	-0.3	-4.7	-0.1
B5	skin highlight L*=89	37.4	13.5	84.3	91.2	14.1	2.6	10.7	8.9
C5	skin highlight L*=75	44.3	18.5	70.6	80.3	21.4	5.7	17.1	16.4
D5	skin shadow L*=25	-97.1	47.8	20.6	42.2	16.1	-25.5	14.1	23.6
E5	skin shadow L*=11	-349.5	49.5	10.9	35.0	6.7	-35.0	1.1	12.4
F5	Max Black	81.9	2.9	2.2	4.0	1.3	2.6	-0.2	1.6

Summary Results	I*Color	I*tone	ΔE
Average Score for all patches	22.8	60.6	19.7
Average Score for the Worst 10% (3 lowest scoring patches)	-244.7	5.6	51.2



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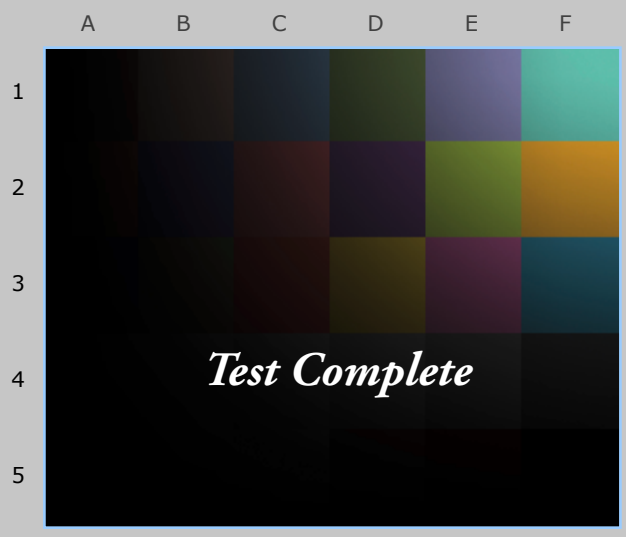
Original Print Colors
(measured before light exposure)



No further updates

Epson 1270, Epson OEM Ink,
Epson Colorlife Photo Paper

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