

Tested System:

ID#: 319

Printer: Epson SureColor P600

Inks/Colorants: Epson UltraChrome HD

Media: Epson Ultra Premium Photo Paper Luster

Coating(s): no additional coating

Sample set: AaI_20161111_SN002

Testing Status: 200 Megalux hours total light exposure

Light Fade Testing is complete. Dark storage samples continue to be updated.

Conservation Display Ratings (CDR) Summary to Date:

Sample(s) exposed to light, measured immediately

Lower limit: 126 Megalux hours (for weakest 10% of the color patches)

Upper limit: 173 Megalux hours (for average of all the color patches)

Light exposed samples measured after 3 to 4 years dark storage

Lower limit: 6.9 Megalux hours (for weakest 10% of the color patches)

Upper limit: 15 Megalux hours (for average of all the color patches)

Dark Storage control sample, no light exposure, measured after 4 years

Lower limit: excellent condition, not exceeding lower CDR limit

Upper limit: excellent condition, not exceeding upper CDR limit

**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.*

* Please read document AaI_2009_0118_TA-01.pdf, **"An Overview of the AaI&A Conservation Display Ratings"**,

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Section I: Process Description

This section contains a description of the tested print process, typically comprised of an inkjet printer, a specific set of inks, and a specific choice of media. However, the test report may also describe other photographic and/or photomechanical printing processes such as conventional chromogenic color processes, alternative B&W processes, dye sublimation, xerographic processes, etc., and the tested samples may also include additional coatings or laminates applied to the print surface at a later stage in the fabrication. This section may also contain illustrations and other documentation about the the process as well.

Epson SureColor P600, Epson UltraChrome HD, Epson Ultra Premium Photo Paper Luster, no additional coating

Sample Set: AaI_20161111_SN002 **Batch #:** P1
Printer: Epson SureColor P600
Ink: Epson UltraChrome HD
Media: Epson Ultra Premium Photo Paper Luster
Coating(s): no additional coating

Test Print Prepared by: AaI&A
Printed: November 11, 2106
Initial Print colors measured November 21, 2016
Test Started: November 30, 2016

Test Image: AaI_StandardColorSet(v2)forSRGB.tif
RIP/Driver settings: 5760dpi, High speed=off

Media Setting Epson Ultra Premium Luster

Profile: Epson SC-P600 Series Premium Luster **Rendering Intent:** perceptual
Profile type: generic, Epson supplied profile

Paper White and Maximum Printed Black Values (M0 readings)

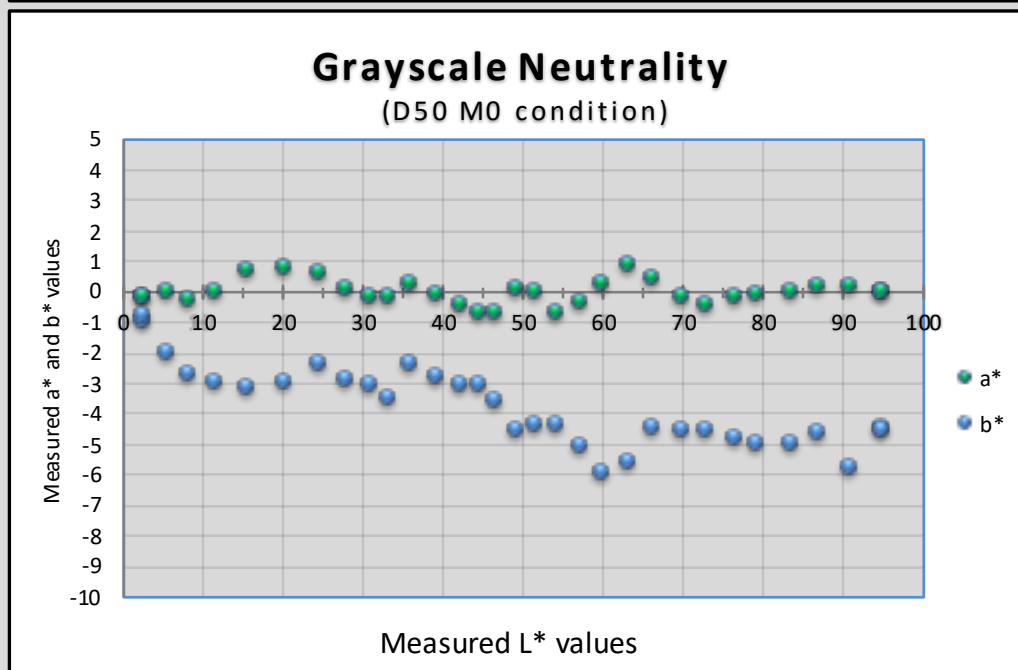
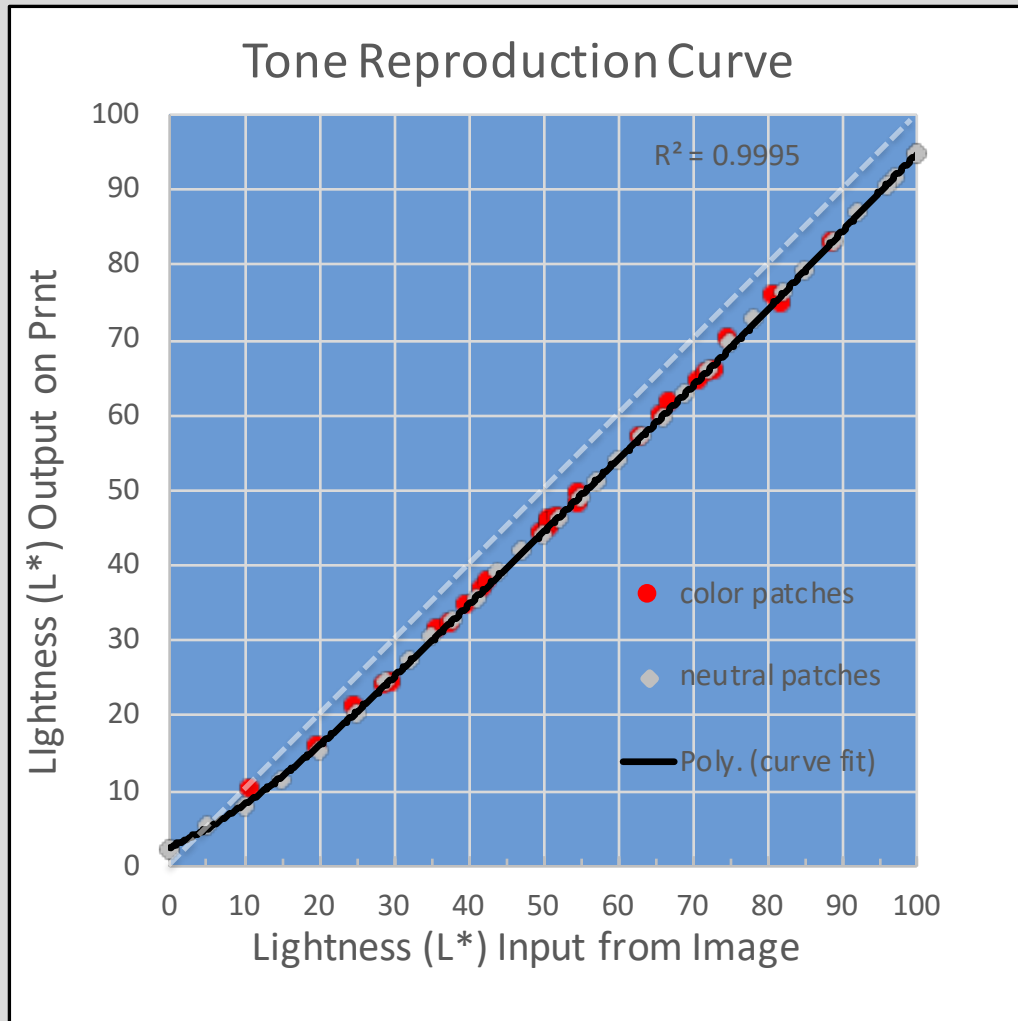
Optical brighteners Present? <i>yes (medium)</i>		L*		a*		b*	
M0 Media Whitepoint Color ISO 13655-2009: L* = 94.8 a* = 0.1 b* = -4.3		UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
		94.8	94.7	0.1	-0.8	-4.3	-1.3
		UV-inc/UV-exc ΔL^*, Δa^*, Δb^* respectively					
		0.1		0.9		3.0	
		<i>Calculated differences, especially for Δb^*, indicate the role and magnitude of fluorescence on original paper color</i>					
Maximum Printed Black		L*	a*	b*	Optical Density (Dmax)		
		2.4	-0.2	-0.8	2.57		

Paper White and Maximum Printed Black Values (M1 readings)

		L*		a*		b*	
M1 Media Whitepoint Color ISO 13655-2009:		UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
		94.9	94.7	0.3	-0.8	-5.5	-1.3
		UV-inc/UV-exc ΔL*, Δa*, Δb* respectively					
		0.2		1.1		4.2	
		Calculated differences, especially for Δb*, indicate the role and magnitude of fluorescence on original paper color					
L* =	94.9						
a* =	0.3						
b* =	-5.5						
Maximum Printed Black		L*	a*	b*	Optical Density (Dmax)		
		2.4	-0.2	-0.8	2.57		

Light source: Phillips Colortone F40T12/C50 – 5000°K full spectrum fluorescent. Color rendering Index (CRI) =92)
Light Exposure Cycle: ~12klux illumination, 24 hours per day
Average Temperature: 24.9°C over full test duration, 25.1°C during light exposure.
Average Relative humidity: 53.3%RH over full test duration, 53.2%RH during light exposure.
CIELAB measurements: D50 2° observer, Xrite i1Pro2, M0,M1, and M2 conditions where applicable

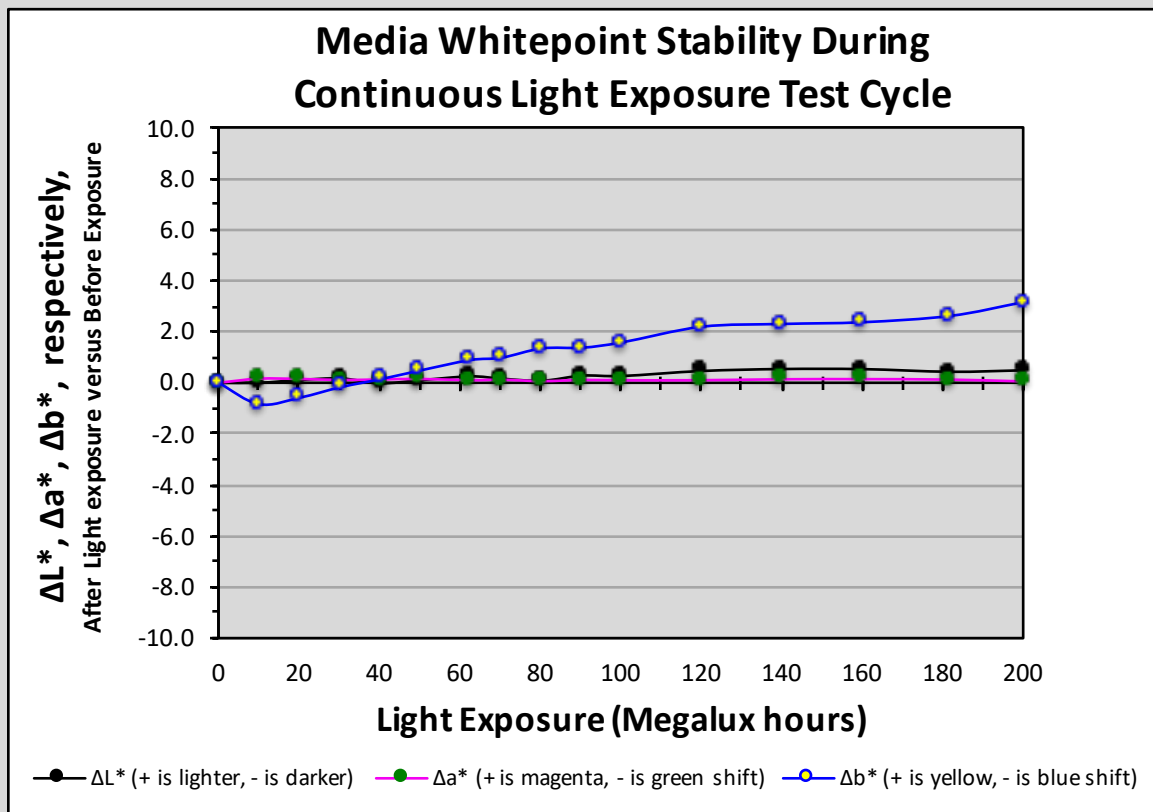
Initial Image Reproduction – Tone Curve and Grayscale Neutrality

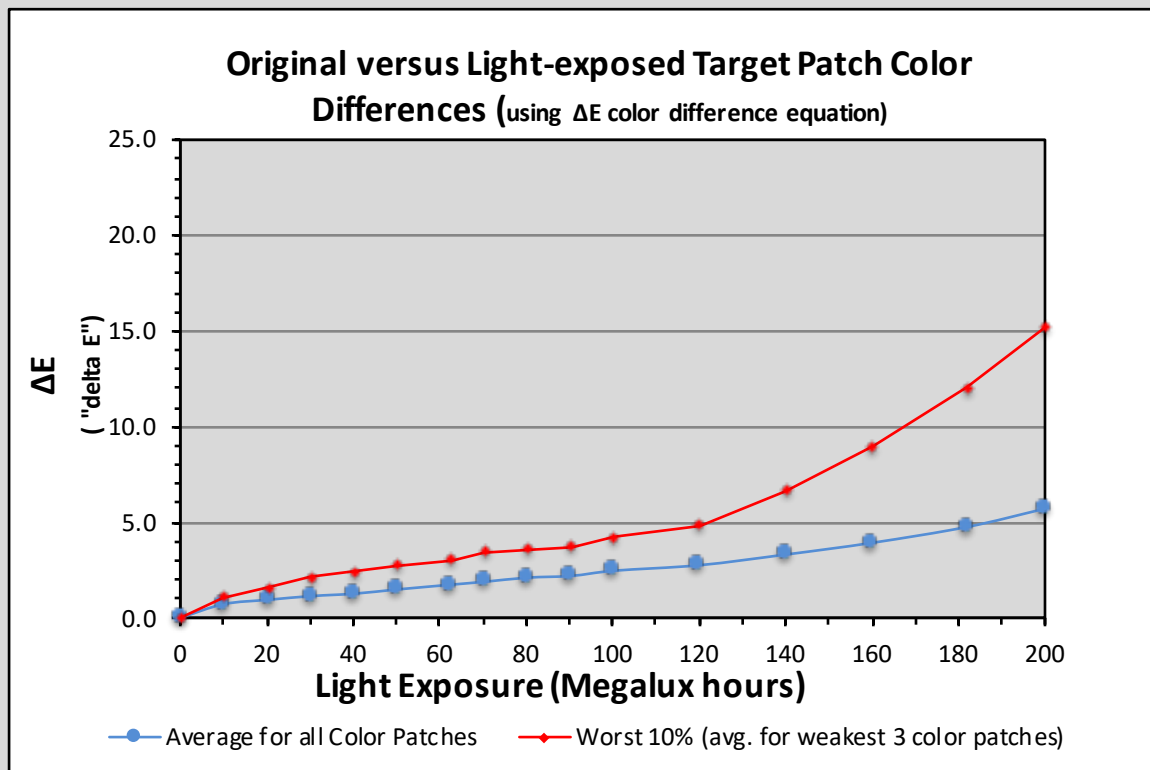
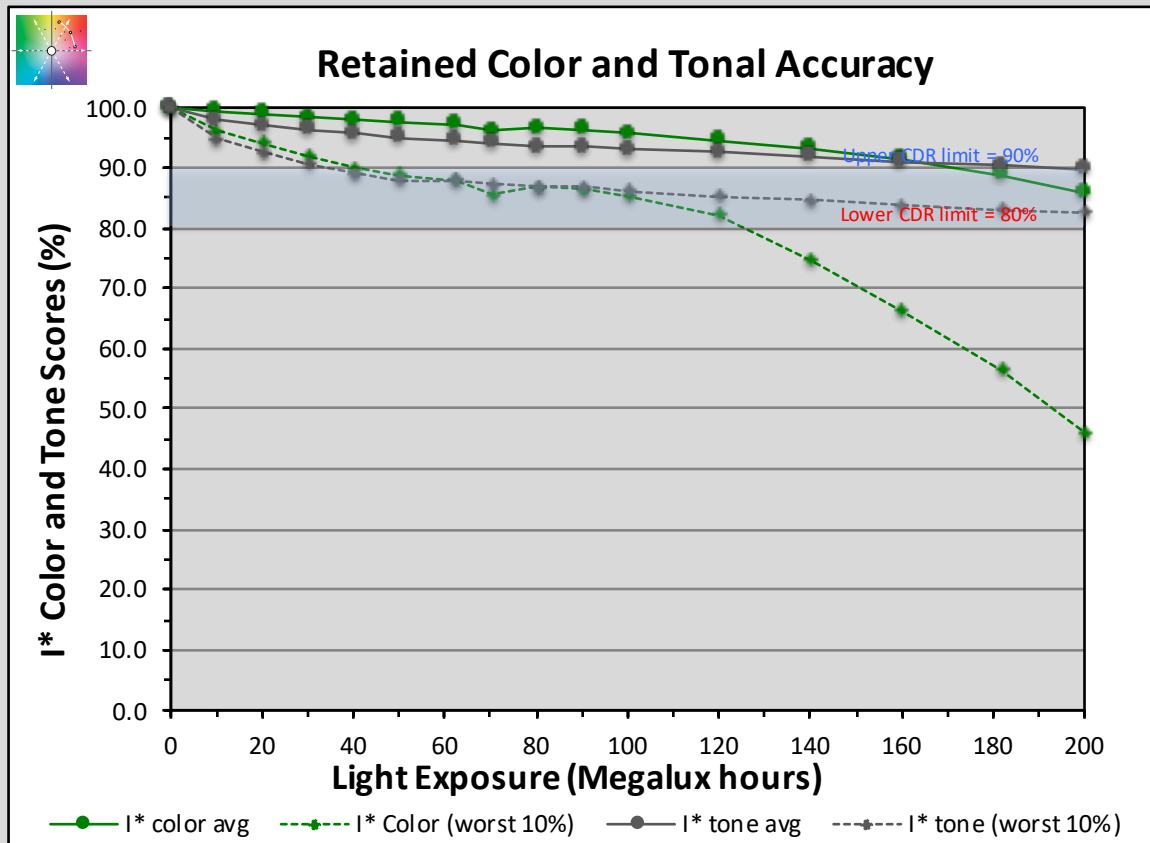


Section II: Accelerated Light Fade test results

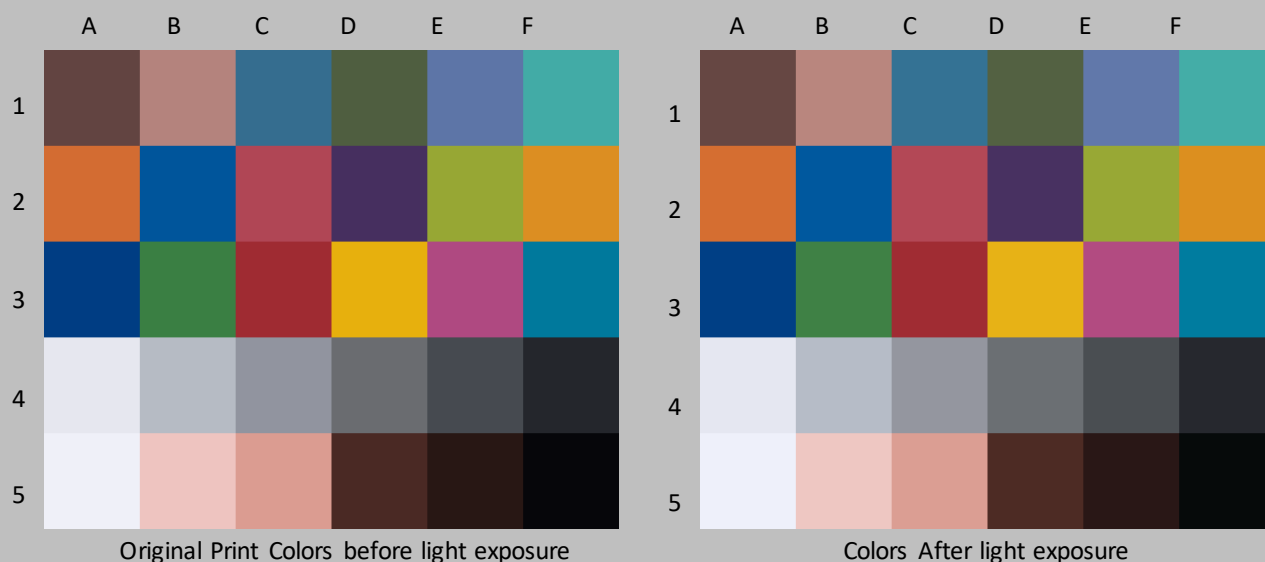
This section of the report contains the light exposure test results measured immediately after each exposure interval is completed. Samples are pulled directly from the light fade test unit, measured within a few hours using an Xrite i1 Pro2 spectrophotometer, and then returned to the test unit for additional ongoing exposure. This methodology is a traditional scientific approach to light fastness testing of photographic materials, and provides insight into the fade resistance of the image forming colorants as well as the fade and discoloration resistance of the media when exposed to continuous illumination on display. However, it does not account for any photochemical reaction products which may require longer time periods at ambient room temperature and relative humidity levels to form additional staining or yellowing appearance. Some reaction products are metastable and thus light bleachable, appearing and/or reappearing only over time when the print is displayed under significantly lower average illumination levels or stored in the dark when not continuously on display. See section III for test conditions designed to track this other potential media yellowing issue.

Epson SureColor P600, Epson UltraChrome HD, Epson Ultra Premium Photo Paper Luster, no additional coating

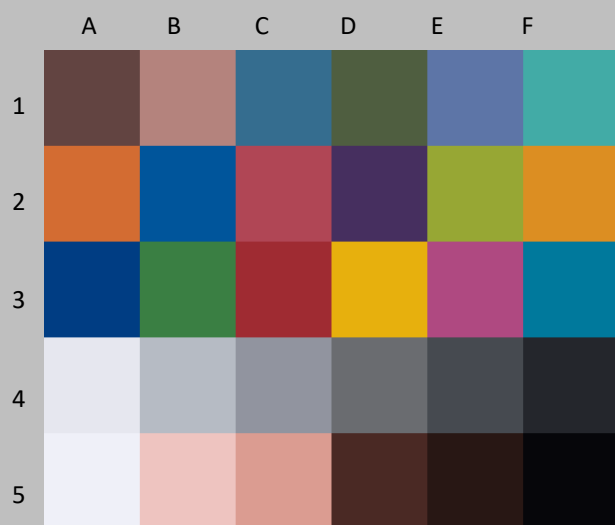




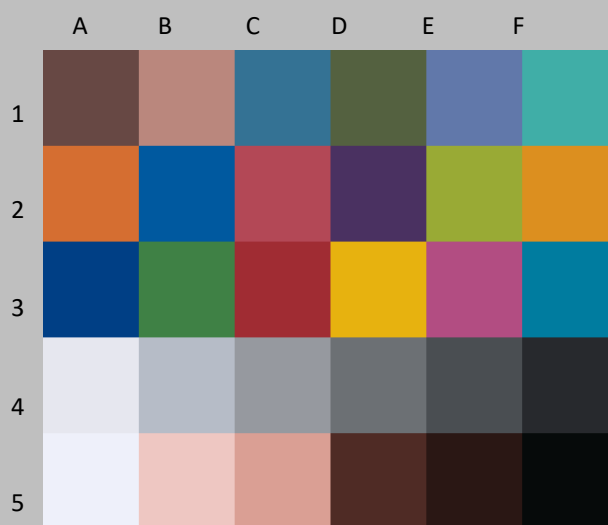
Epson SureColor P600, Epson UltraChrome HD, Epson Ultra Premium Photo Paper Luster, no additional coating



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	100.0	0.9	32.9	33.7	12.2	12.1	7.8	8.2
B1	Light Skin	100.0	0.7	60.2	60.7	17.2	16.7	12.5	12.4
C1	Blue sky	99.3	1.0	44.6	45.4	-8.2	-8.7	-24.1	-24.6
D1	Foliage	100.0	0.8	38.3	39.0	-11.8	-12.1	16.1	16.4
E1	blue flower	99.9	0.9	49.7	50.4	4.3	4.0	-28.8	-29.3
F1	bluish green	100.0	0.4	64.6	65.0	-32.4	-32.5	-6.1	-6.3
A1	orange	99.3	1.0	57.3	57.6	35.8	34.9	50.1	49.9
B2	purplish blue	99.3	1.1	35.0	35.8	0.1	-0.7	-46.5	-46.5
C2	moderate red	100.0	0.5	45.1	45.4	44.2	43.8	14.1	14.1
D2	purple	100.0	0.5	24.6	25.1	21.4	21.3	-24.6	-24.7
E2	yellow green	100.0	0.2	65.9	66.0	-22.3	-22.5	54.9	54.8
F2	orange yellow	99.3	1.0	65.7	65.9	20.7	19.8	64.8	64.5
A3	blue	99.8	0.8	24.2	24.7	2.0	1.4	-48.9	-49.1
B3	green	100.0	0.4	48.4	48.7	-35.4	-35.3	26.3	26.0
C3	red	100.0	0.3	37.0	37.1	46.8	46.7	24.1	23.9
D3	yellow	99.7	0.8	75.2	75.2	6.8	6.1	75.6	75.2
E3	magenta	99.8	0.7	46.8	47.2	47.1	46.6	-10.2	-10.4
F3	cyan	99.6	0.9	46.2	46.8	-24.4	-24.3	-28.5	-29.1
A4	white	98.6	0.6	91.8	91.8	0.4	0.5	-4.1	-4.7
B4	neutral 8	94.1	1.1	75.9	76.2	-1.0	-1.0	-4.9	-5.9
C4	neutral 6.5	100.0	0.8	61.8	62.5	-0.2	-0.2	-5.4	-5.0
D4	neutral 5	100.0	0.9	46.1	46.9	-0.1	-0.6	-2.5	-2.5
E4	neutral 3.5	100.0	0.8	32.0	32.7	-0.5	-0.8	-3.3	-3.3
F4	black	100.0	0.6	15.9	16.5	0.5	0.4	-3.6	-3.7
A5	paper white	96.3	0.9	94.8	94.8	0.1	0.2	-4.5	-5.3
B5	Skin highlight L*=88	99.9	0.5	83.4	83.4	12.5	12.3	8.6	8.2
C5	Skin highlight L*=75	98.3	1.0	70.3	70.8	20.6	19.8	15.5	15.0
D5	Skin shadow L*=28	99.9	0.7	21.6	22.0	14.4	14.5	10.6	11.1
E5	Skin shadow L*=13	100.0	0.5	10.6	10.8	8.2	8.4	4.9	5.3
F5	Maximum Black	100.0	0.1	2.6	2.6	-0.2	-0.3	-1.0	-0.9
Summary Results		I* Color	I* tone	ΔE	10 Megalux hours				
Average Score for all patches		99.4	97.9	0.7					
Worst 10% (3 lowest scoring patches)		96.2	94.9	1.1					



Original Print Colors before light exposure

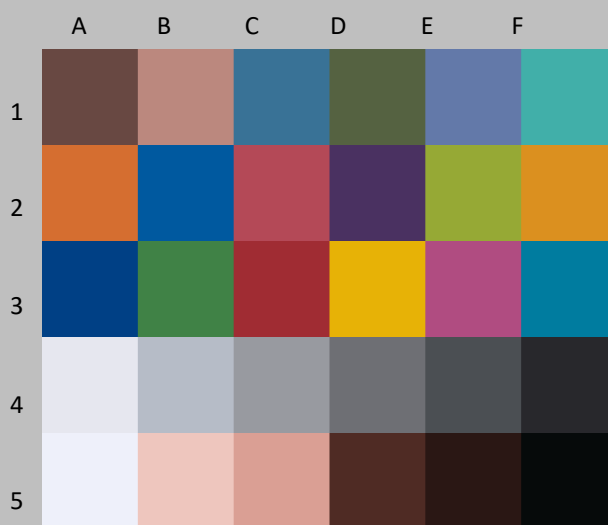


Colors After light exposure

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	98.8	1.4	32.9	34.1	12.2	12.0	7.8	8.4
B1	Light Skin	99.5	1.0	60.2	61.0	17.2	16.7	12.5	12.9
C1	Blue sky	99.1	1.2	44.6	45.5	-8.2	-8.6	-24.1	-24.7
D1	Foliage	99.9	1.1	38.3	39.3	-11.8	-12.1	16.1	16.5
E1	blue flower	100.0	1.0	49.7	50.6	4.3	4.3	-28.8	-29.2
F1	bluish green	100.0	0.5	64.6	65.1	-32.4	-32.5	-6.1	-6.2
A1	orange	98.9	1.2	57.3	57.7	35.8	34.6	50.1	50.0
B2	purplish blue	98.8	1.5	35.0	36.0	0.1	-1.0	-46.5	-46.3
C2	moderate red	99.9	0.7	45.1	45.5	44.2	43.7	14.1	14.2
D2	purple	100.0	0.8	24.6	25.3	21.4	21.2	-24.6	-24.5
E2	yellow green	100.0	0.3	65.9	66.1	-22.3	-22.5	54.9	54.9
F2	orange yellow	99.0	1.2	65.7	66.1	20.7	19.5	64.8	64.8
A3	blue	99.0	1.2	24.2	24.9	2.0	1.0	-48.9	-48.9
B3	green	100.0	0.5	48.4	48.8	-35.4	-35.3	26.3	26.0
C3	red	100.0	0.3	37.0	37.3	46.8	46.7	24.1	24.3
D3	yellow	99.4	1.0	75.2	75.4	6.8	5.8	75.6	75.5
E3	magenta	99.6	0.9	46.8	47.3	47.1	46.4	-10.2	-10.1
F3	cyan	99.2	1.1	46.2	47.0	-24.4	-24.0	-28.5	-29.1
A4	white	100.0	0.4	91.8	91.9	0.4	0.5	-4.1	-4.4
B4	neutral 8	92.5	1.3	75.9	76.2	-1.0	-1.2	-4.9	-6.1
C4	neutral 6.5	93.3	1.7	61.8	63.1	-0.2	-0.2	-5.4	-4.2
D4	neutral 5	100.0	1.2	46.1	47.1	-0.1	-0.6	-2.5	-2.7
E4	neutral 3.5	100.0	1.2	32.0	33.1	-0.5	-0.8	-3.3	-3.1
F4	black	100.0	0.9	15.9	16.7	0.5	0.3	-3.6	-3.2
A5	paper white	99.0	0.6	94.8	94.9	0.1	0.2	-4.5	-5.0
B5	Skin highlight L*=88	100.0	0.5	83.4	83.5	12.5	12.2	8.6	8.4
C5	Skin highlight L*=75	96.7	1.6	70.3	71.1	20.6	19.3	15.5	14.9
D5	Skin shadow L*=28	98.5	1.0	21.6	22.3	14.4	14.5	10.6	11.3
E5	Skin shadow L*=13	97.1	0.9	10.6	11.0	8.2	8.4	4.9	5.6
F5	Maximum Black	100.0	0.2	2.6	2.8	-0.2	-0.3	-1.0	-0.9
Summary Results		I* Color	I* tone	ΔE	20 Megalux hours				
Average Score for all patches		98.9	97.1	0.9					
Worst 10% (3 lowest scoring patches)		94.1	92.6	1.6					

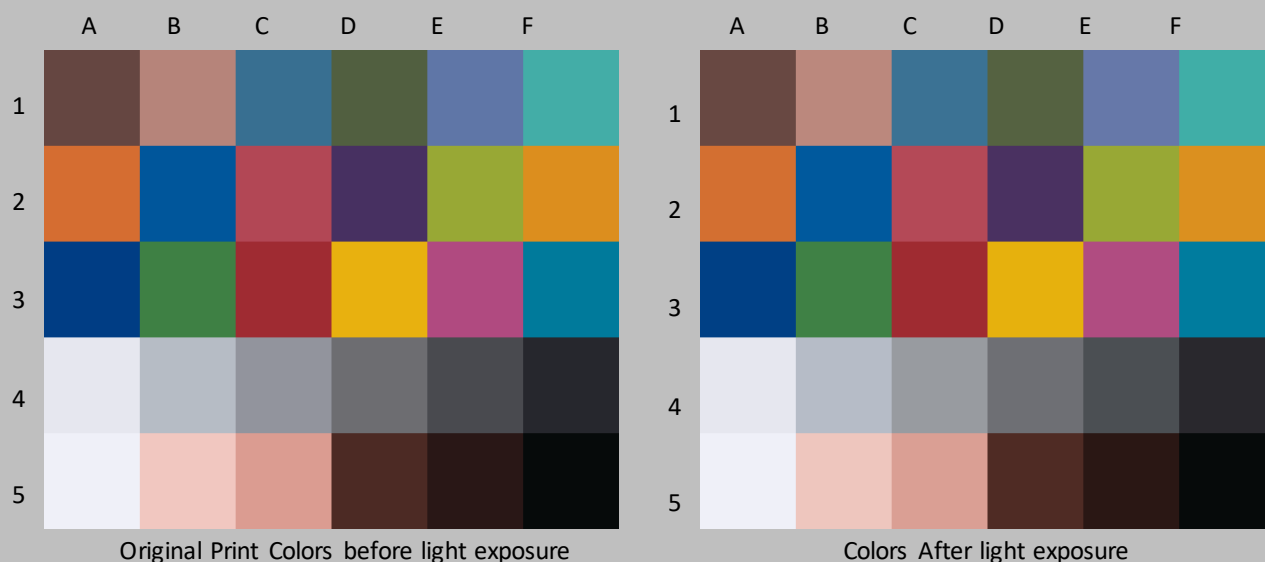


Original Print Colors before light exposure

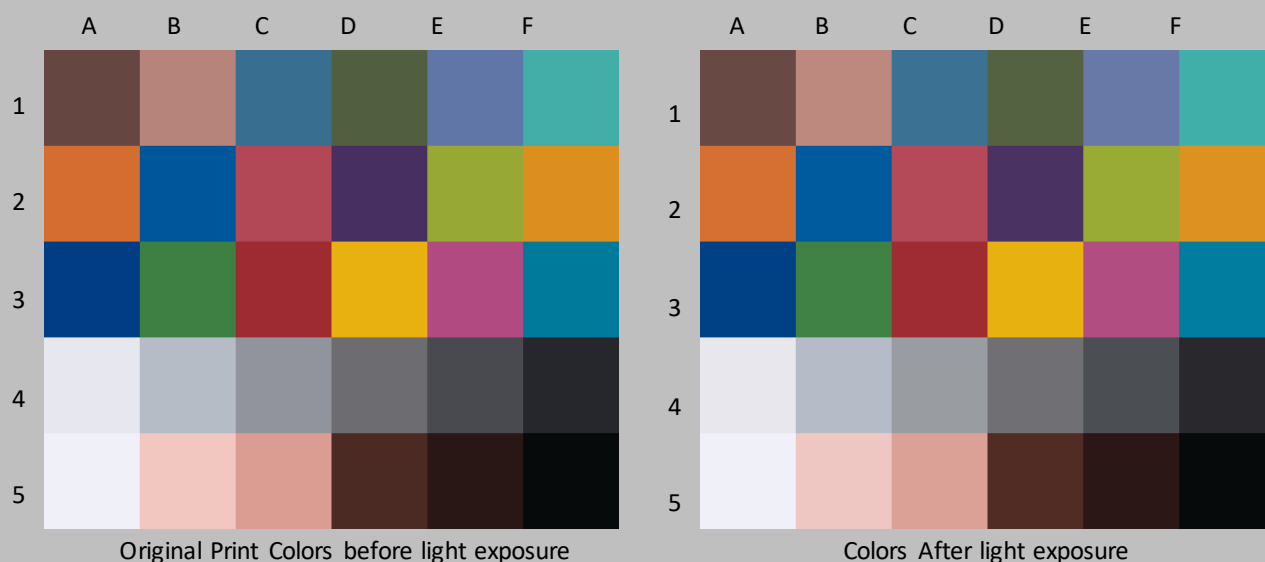


Colors After light exposure

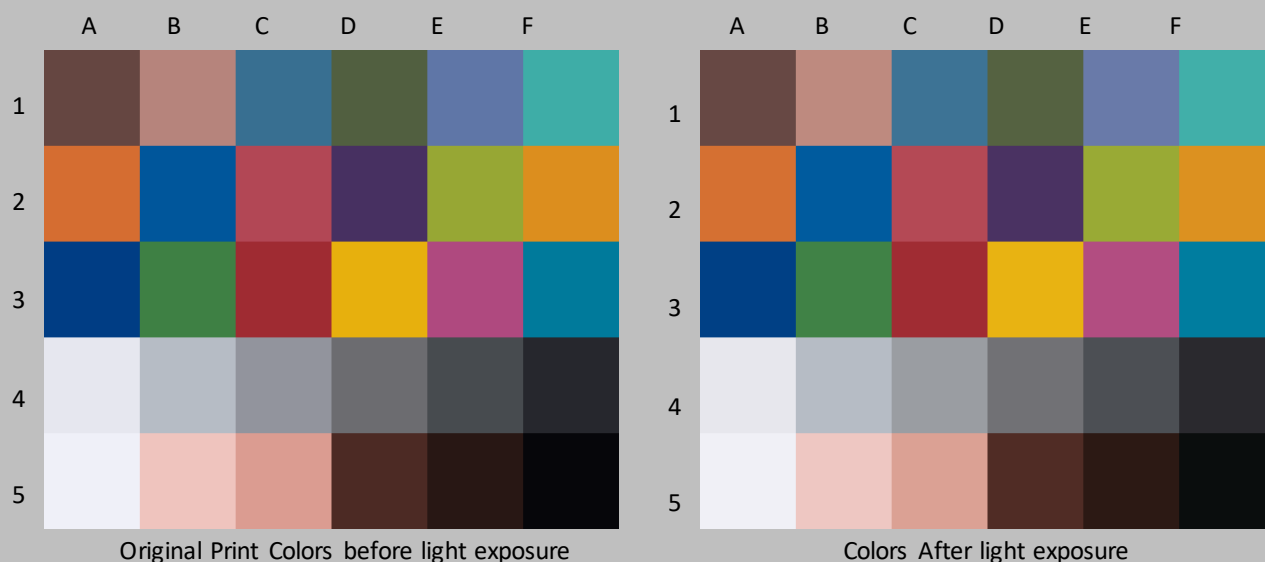
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	97.6	1.4	32.9	34.0	12.0	12.0	8.0	8.8
B1	Light Skin	97.0	1.7	60.1	61.4	17.2	16.6	12.4	13.4
C1	Blue sky	100.0	1.3	44.6	45.7	-8.2	-8.3	-24.0	-24.5
D1	Foliage	98.4	1.4	38.3	39.4	-11.9	-12.1	16.1	16.8
E1	blue flower	100.0	1.2	49.7	50.9	4.2	4.4	-28.6	-28.4
F1	bluish green	100.0	0.8	64.6	65.3	-32.6	-32.7	-5.9	-6.0
A2	orange	98.6	1.5	57.1	57.7	35.9	34.6	50.0	50.5
B2	purplish blue	98.1	1.8	35.0	36.2	0.1	-1.2	-46.2	-45.8
C2	moderate red	99.7	0.9	45.2	45.7	44.2	43.7	13.9	14.3
D2	purple	99.9	1.0	24.6	25.5	21.5	21.1	-24.5	-24.1
E2	yellow green	100.0	0.5	65.7	66.1	-22.4	-22.6	55.0	55.3
F2	orange yellow	98.6	1.6	65.4	66.0	20.8	19.5	64.6	65.2
A3	blue	98.0	1.7	24.1	25.0	2.0	0.6	-48.8	-48.5
B3	green	100.0	0.5	48.4	48.8	-35.4	-35.3	26.4	26.2
C3	red	100.0	0.6	36.8	37.1	46.8	46.9	24.0	24.4
D3	yellow	99.2	1.2	74.7	75.2	7.1	6.1	76.2	76.6
E3	magenta	99.3	1.1	46.5	47.2	47.0	46.4	-10.4	-9.9
F3	cyan	100.0	1.1	46.1	47.1	-24.4	-23.9	-28.5	-28.7
A4	white	100.0	0.1	91.7	91.8	0.3	0.3	-3.9	-3.9
B4	neutral 8	95.8	0.9	75.9	76.2	-0.9	-1.3	-4.8	-5.6
C4	neutral 6.5	86.0	2.6	61.7	63.5	-0.3	-0.5	-5.4	-3.5
D4	neutral 5	100.0	1.3	46.0	47.2	-0.2	-0.5	-2.4	-2.6
E4	neutral 3.5	99.1	1.4	31.9	33.2	-0.6	-0.9	-3.2	-2.7
F4	black	99.9	0.9	15.9	16.6	0.6	0.5	-3.6	-3.1
A5	paper white	100.0	0.3	94.8	95.0	0.1	0.2	-4.3	-4.5
B5	Skin highlight L*=88	98.6	0.9	82.8	83.3	12.7	12.0	8.8	8.5
C5	Skin highlight L*=75	95.5	2.0	70.1	71.1	20.7	19.2	15.5	14.9
D5	Skin shadow L*=28	98.2	1.3	21.4	22.4	14.5	14.7	10.7	11.5
E5	Skin shadow L*=13	94.5	1.1	10.3	10.6	8.4	8.8	5.2	6.1
F5	Maximum Black	100.0	0.3	2.4	2.6	-0.2	-0.4	-0.8	-0.7
Summary Results		I* Color	I* tone	ΔE	30 Megalux hours				
Average Score for all patches		98.4	96.4	1.1					
Worst 10% (3 lowest scoring patches)		92.0	90.7	2.1					



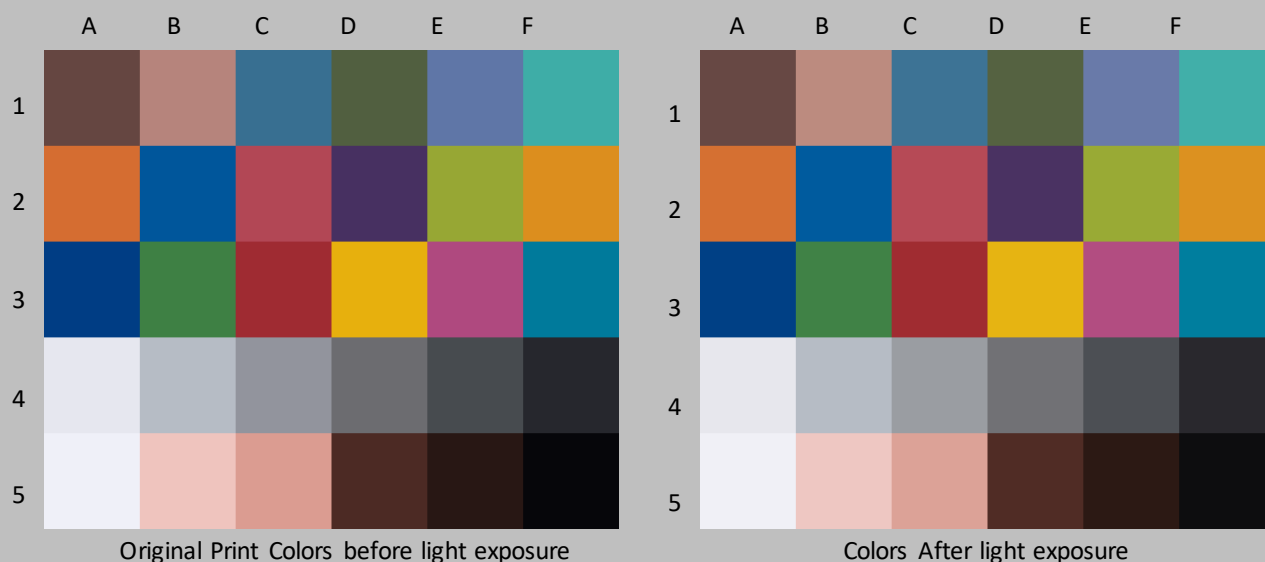
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	98.1	1.6	32.9	34.2	12.0	12.1	8.0	8.7
B1	Light Skin	95.0	2.1	60.1	61.6	17.2	16.6	12.4	13.8
C1	Blue sky	100.0	1.3	44.6	45.7	-8.2	-8.0	-24.0	-24.4
D1	Foliage	99.7	1.4	38.3	39.5	-11.9	-12.0	16.1	16.6
E1	blue flower	98.4	1.6	49.7	51.0	4.2	4.6	-28.6	-27.7
F1	bluish green	100.0	0.7	64.6	65.3	-32.6	-32.6	-5.9	-6.0
A1	orange	98.4	1.5	57.1	57.6	35.9	34.4	50.0	50.1
B2	purplish blue	97.5	2.0	35.0	36.2	0.1	-1.3	-46.2	-45.4
C2	moderate red	99.4	1.0	45.2	45.7	44.2	43.5	13.9	14.3
D2	purple	99.0	1.3	24.6	25.5	21.5	21.1	-24.5	-23.8
E2	yellow green	100.0	0.3	65.7	65.9	-22.4	-22.4	55.0	54.9
F2	orange yellow	98.4	1.6	65.4	65.9	20.8	19.3	64.6	64.9
A3	blue	97.6	1.9	24.1	25.0	2.0	0.4	-48.8	-48.2
B3	green	100.0	0.6	48.4	48.7	-35.4	-35.1	26.4	26.0
C3	red	99.8	0.7	36.8	37.0	46.8	46.7	24.0	24.6
D3	yellow	99.0	1.3	74.7	75.1	7.1	5.9	76.2	76.4
E3	magenta	98.7	1.3	46.5	47.1	47.0	46.2	-10.4	-9.6
F3	cyan	99.5	1.2	46.1	47.1	-24.4	-23.7	-28.5	-28.3
A4	white	100.0	0.4	91.7	91.6	0.3	0.4	-3.9	-3.6
B4	neutral 8	96.2	0.9	75.9	75.9	-0.9	-1.3	-4.8	-5.6
C4	neutral 6.5	82.7	3.0	61.7	63.7	-0.3	-0.6	-5.4	-3.2
D4	neutral 5	100.0	1.2	46.0	47.2	-0.2	-0.2	-2.4	-2.5
E4	neutral 3.5	99.0	1.5	31.9	33.2	-0.6	-0.8	-3.2	-2.7
F4	black	97.8	1.1	15.9	16.7	0.6	0.5	-3.6	-2.9
A5	paper white	100.0	0.2	94.8	94.8	0.1	0.2	-4.3	-4.2
B5	Skin highlight L*=88	98.3	0.9	82.8	83.2	12.7	12.0	8.8	8.5
C5	Skin highlight L*=75	94.5	2.1	70.1	71.1	20.7	19.0	15.5	14.6
D5	Skin shadow L*=28	95.8	1.6	21.4	22.4	14.5	14.7	10.7	11.9
E5	Skin shadow L*=13	92.7	1.3	10.3	10.7	8.4	8.9	5.2	6.3
F5	Maximum Black	100.0	0.5	2.4	2.8	-0.2	-0.4	-0.8	-0.8
Summary Results		I* Color	I* tone	ΔE	40 Megalux hours				
Average Score for all patches		97.8	95.8	1.3					
Worst 10% (3 lowest scoring patches)		90.0	89.1	2.4					



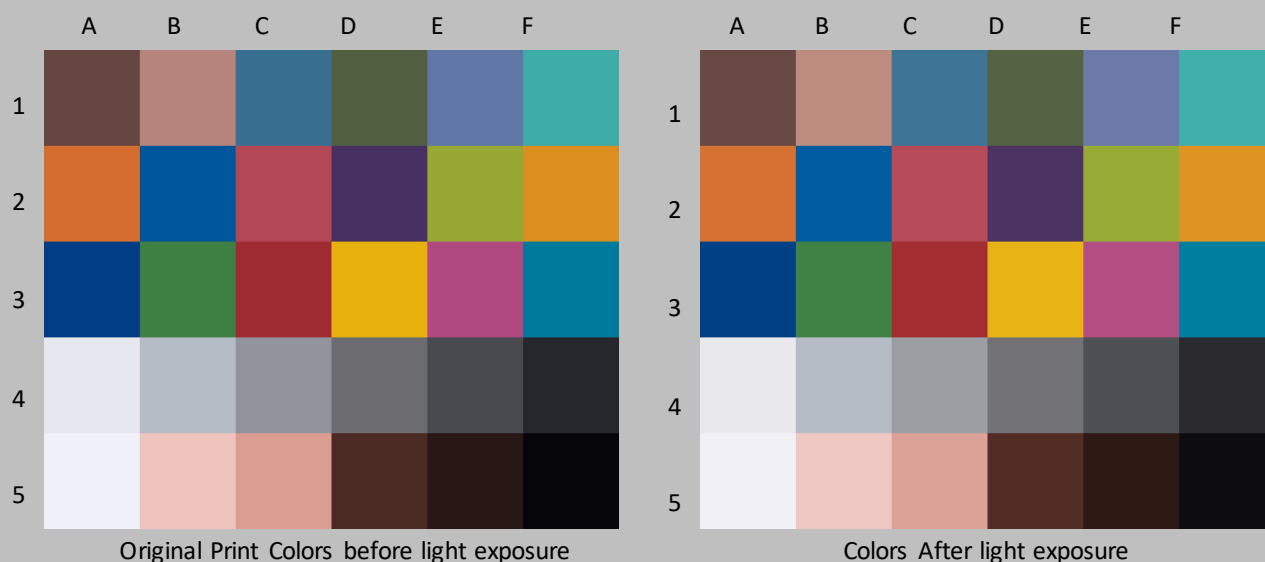
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	98.7	1.7	32.9	34.4	12.0	12.3	8.0	8.6
B1	Light Skin	95.2	2.4	60.1	62.0	17.2	16.5	12.4	13.8
C1	Blue sky	100.0	1.6	44.6	46.1	-8.2	-7.8	-24.0	-24.2
D1	Foliage	100.0	1.6	38.3	39.8	-11.9	-11.9	16.1	16.5
E1	blue flower	97.0	2.1	49.7	51.4	4.2	4.7	-28.6	-27.3
F1	bluish green	100.0	1.0	64.6	65.5	-32.6	-32.6	-5.9	-6.1
A1	orange	98.4	1.7	57.1	57.9	35.9	34.4	50.0	50.0
B2	purplish blue	97.4	2.2	35.0	36.5	0.1	-1.4	-46.2	-45.4
C2	moderate red	99.8	1.0	45.2	45.9	44.2	43.7	13.9	14.3
D2	purple	99.1	1.4	24.6	25.8	21.5	21.2	-24.5	-23.8
E2	yellow green	100.0	0.5	65.7	66.2	-22.4	-22.5	55.0	54.9
F2	orange yellow	98.2	1.9	65.4	66.2	20.8	19.2	64.6	65.0
A3	blue	97.2	2.1	24.1	25.1	2.0	0.3	-48.8	-48.2
B3	green	100.0	0.7	48.4	48.9	-35.4	-35.1	26.4	26.0
C3	red	100.0	0.7	36.8	37.2	46.8	47.0	24.0	24.4
D3	yellow	98.7	1.6	74.7	75.4	7.1	5.7	76.2	76.4
E3	magenta	98.4	1.7	46.5	47.5	47.0	46.2	-10.4	-9.4
F3	cyan	99.4	1.5	46.1	47.4	-24.4	-23.8	-28.5	-28.1
A4	white	97.8	0.7	91.7	91.8	0.3	0.4	-3.9	-3.2
B4	neutral 8	97.1	0.8	75.9	76.0	-0.9	-1.2	-4.8	-5.5
C4	neutral 6.5	81.2	3.4	61.7	64.2	-0.3	-0.7	-5.4	-3.1
D4	neutral 5	100.0	1.6	46.0	47.5	-0.2	0.0	-2.4	-2.5
E4	neutral 3.5	100.0	1.7	31.9	33.5	-0.6	-0.6	-3.2	-2.8
F4	black	99.3	1.2	15.9	16.9	0.6	0.7	-3.6	-3.1
A5	paper white	100.0	0.5	94.8	94.9	0.1	0.2	-4.3	-3.9
B5	Skin highlight L*=88	97.9	1.1	82.8	83.5	12.7	12.0	8.8	8.4
C5	Skin highlight L* =75	93.8	2.4	70.1	71.3	20.7	18.9	15.5	14.4
D5	Skin shadow L*=28	95.4	1.8	21.4	22.6	14.5	15.0	10.7	11.9
E5	Skin shadow L*=13	91.8	1.4	10.3	10.9	8.4	9.1	5.2	6.2
F5	Maximum Black	100.0	0.5	2.4	2.9	-0.2	-0.3	-0.8	-1.0
Summary Results		I* Color	I* tone	ΔE	50 Megalux hours				
Average Score for all patches		97.7	95.1	1.5					
Worst 10% (3 lowest scoring patches)		88.9	87.8	2.7					



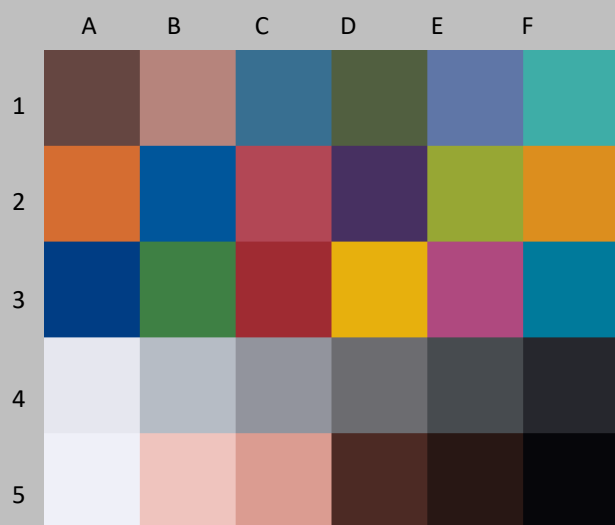
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	99.6	1.6	32.6	34.1	12.0	12.3	7.8	8.3
B1	Light Skin	96.4	2.5	60.2	62.4	17.2	16.5	12.5	13.6
C1	Blue sky	99.7	1.8	44.4	46.2	-8.3	-7.8	-24.2	-24.0
D1	Foliage	100.0	1.7	38.0	39.7	-12.0	-11.9	16.2	16.5
E1	blue flower	95.6	2.7	49.6	51.6	4.0	4.6	-28.6	-26.9
F1	bluish green	100.0	1.1	64.4	65.5	-32.7	-32.6	-5.8	-6.1
A1	orange	98.2	1.9	57.1	58.1	35.9	34.3	50.6	50.3
B2	purplish blue	97.6	2.3	34.8	36.5	-0.1	-1.5	-46.3	-45.4
C2	moderate red	100.0	1.1	45.0	46.1	44.2	43.8	14.6	14.6
D2	purple	99.3	1.6	24.3	25.8	21.2	21.0	-24.5	-23.8
E2	yellow green	100.0	0.9	65.5	66.3	-22.4	-22.5	55.2	54.8
F2	orange yellow	98.1	2.1	65.2	66.4	20.8	19.1	65.0	64.8
A3	blue	96.9	2.4	23.9	25.2	1.8	-0.1	-48.7	-48.0
B3	green	99.9	0.9	48.1	48.9	-35.5	-35.1	26.3	25.9
C3	red	100.0	0.8	36.7	37.4	46.8	47.1	24.3	24.4
D3	yellow	98.5	2.0	74.5	75.6	7.3	5.7	76.5	76.2
E3	magenta	98.7	1.7	46.3	47.6	46.8	46.2	-10.3	-9.3
F3	cyan	98.9	1.9	46.0	47.6	-24.4	-23.8	-28.4	-27.7
A4	white	94.2	1.1	91.5	91.9	0.3	0.3	-3.9	-2.9
B4	neutral 8	98.6	0.7	75.8	76.0	-1.0	-1.3	-4.7	-5.2
C4	neutral 6.5	80.9	3.7	61.7	64.5	-0.4	-0.8	-5.3	-3.1
D4	neutral 5	100.0	1.8	45.9	47.7	-0.3	0.0	-2.4	-2.3
E4	neutral 3.5	100.0	2.0	31.8	33.7	-0.6	-0.6	-3.2	-2.8
F4	black	100.0	1.4	15.8	17.1	0.5	0.6	-3.4	-3.0
A5	paper white	95.8	0.9	94.8	95.1	0.1	0.2	-4.3	-3.4
B5	Skin highlight L*=88	96.7	1.4	82.7	83.7	12.7	11.8	8.9	8.4
C5	Skin highlight L*=75	93.7	2.6	70.1	71.5	20.7	18.8	15.5	14.6
D5	Skin shadow L*=28	92.9	2.2	21.5	22.7	14.4	15.0	10.7	12.4
E5	Skin shadow L*=13	89.9	1.8	10.3	11.2	8.4	8.9	5.3	6.8
F5	Maximum Black	100.0	1.4	2.3	3.7	-0.2	-0.4	-0.9	-1.1
Summary Results		I* Color	I* tone	ΔE	62.6 Megalux hours				
Average Score for all patches		97.3	94.6	1.7					
Worst 10% (3 lowest scoring patches)		87.9	87.9	3.0					



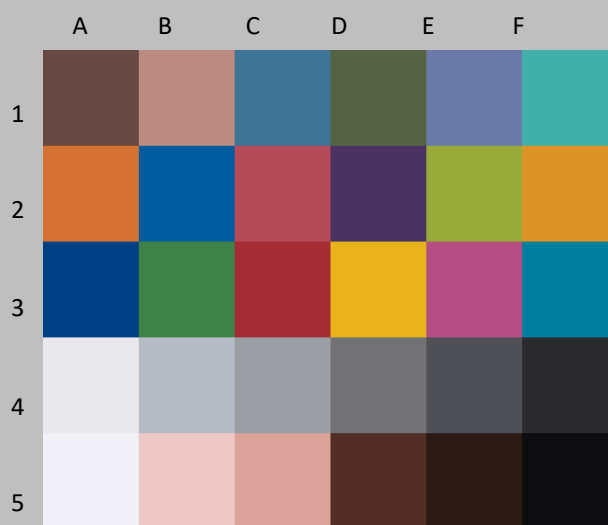
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	91.8	2.4	32.6	34.2	12.0	12.3	7.8	8.4
B1	Light Skin	93.3	3.0	60.2	62.5	17.2	16.5	12.5	13.6
C1	Blue sky	99.0	2.0	44.4	46.3	-8.3	-7.8	-24.2	-23.7
D1	Foliage	97.7	1.8	38.0	39.7	-12.0	-11.9	16.2	16.7
E1	blue flower	93.5	3.2	49.6	51.7	4.0	4.6	-28.6	-26.5
F1	bluish green	100.0	1.1	64.4	65.5	-32.7	-32.6	-5.8	-6.0
A1	orange	98.0	1.9	57.1	58.1	35.9	34.2	50.6	50.2
B2	purplish blue	96.5	2.7	34.8	36.5	-0.1	-1.6	-46.3	-45.2
C2	moderate red	99.9	1.0	45.0	46.1	44.2	43.8	14.6	14.6
D2	purple	98.6	1.7	24.3	25.8	21.2	21.1	-24.5	-23.8
E2	yellow green	100.0	0.8	65.5	66.3	-22.4	-22.4	55.2	54.8
F2	orange yellow	97.9	2.1	65.2	66.4	20.8	18.9	65.0	64.8
A3	blue	96.3	2.6	23.9	25.2	1.8	-0.3	-48.7	-47.9
B3	green	99.2	1.2	48.1	48.9	-35.5	-35.1	26.3	26.0
C3	red	99.6	0.9	36.7	37.4	46.8	47.2	24.3	24.6
D3	yellow	98.6	1.7	74.5	75.6	7.3	5.5	76.5	76.1
E3	magenta	98.2	1.7	46.3	47.6	46.8	46.2	-10.3	-9.3
F3	cyan	98.3	2.1	46.0	47.7	-24.4	-23.8	-28.4	-27.5
A4	white	92.8	1.2	91.5	91.9	0.3	0.4	-3.9	-2.7
B4	neutral 8	99.7	0.5	75.8	75.9	-1.0	-1.3	-4.7	-5.2
C4	neutral 6.5	79.8	3.9	61.7	64.7	-0.4	-0.9	-5.3	-3.1
D4	neutral 5	99.0	2.1	45.9	47.8	-0.3	0.1	-2.4	-2.2
E4	neutral 3.5	98.3	2.1	31.8	33.7	-0.6	-0.6	-3.2	-2.8
F4	black	97.3	1.5	15.8	17.0	0.5	0.7	-3.4	-2.9
A5	paper white	94.9	1.0	94.8	95.0	0.1	0.2	-4.3	-3.3
B5	Skin highlight L*=88	95.4	1.3	82.7	83.7	12.7	11.8	8.9	8.1
C5	Skin highlight L* =75	91.6	3.1	70.1	71.6	20.7	18.7	15.5	14.1
D5	Skin shadow L*=28	91.6	2.4	21.5	22.8	14.4	15.2	10.7	12.2
E5	Skin shadow L*=13	85.4	2.1	10.3	11.2	8.4	9.1	5.3	6.8
F5	Maximum Black	100.0	1.4	2.3	3.7	-0.2	-0.3	-0.9	-0.9
Summary Results		I* Color	I* tone	70 Megalux hours					
Average Score for all patches		96.1	94.2						
Worst 10% (3 lowest scoring patches)		85.6	87.4						



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	98.0	2.3	32.6	34.7	12.0	12.3	7.8	8.5
B1	Light Skin	96.7	2.9	60.2	62.9	17.2	16.5	12.5	13.5
C1	Blue sky	98.9	2.4	44.4	46.6	-8.3	-7.7	-24.2	-23.6
D1	Foliage	100.0	2.0	38.0	40.0	-12.0	-11.9	16.2	16.6
E1	blue flower	93.6	3.4	49.6	52.1	4.0	4.6	-28.6	-26.3
F1	bluish green	100.0	1.5	64.4	65.9	-32.7	-32.6	-5.8	-6.2
A1	orange	98.0	2.2	57.1	58.5	35.9	34.3	50.6	50.0
B2	purplish blue	96.9	2.8	34.8	36.8	-0.1	-1.7	-46.3	-45.1
C2	moderate red	100.0	1.5	45.0	46.5	44.2	44.0	14.6	14.5
D2	purple	99.4	1.9	24.3	26.1	21.2	21.3	-24.5	-23.8
E2	yellow green	99.7	1.4	65.5	66.7	-22.4	-22.6	55.2	54.5
F2	orange yellow	97.7	2.6	65.2	66.9	20.8	18.8	65.0	64.5
A3	blue	96.5	2.7	23.9	25.4	1.8	-0.3	-48.7	-48.0
B3	green	99.8	1.2	48.1	49.2	-35.5	-35.2	26.3	25.8
C3	red	99.5	1.3	36.7	37.7	46.8	47.5	24.3	24.6
D3	yellow	97.9	2.7	74.5	76.1	7.3	5.3	76.5	75.8
E3	magenta	98.6	2.0	46.3	47.9	46.8	46.3	-10.3	-9.2
F3	cyan	98.3	2.3	46.0	48.0	-24.4	-23.9	-28.4	-27.4
A4	white	89.1	1.6	91.5	92.0	0.3	0.3	-3.9	-2.4
B4	neutral 8	100.0	0.5	75.8	76.0	-1.0	-1.3	-4.7	-5.1
C4	neutral 6.5	81.0	4.1	61.7	65.0	-0.4	-0.9	-5.3	-3.1
D4	neutral 5	99.9	2.2	45.9	48.0	-0.3	0.2	-2.4	-2.2
E4	neutral 3.5	100.0	2.2	31.8	33.9	-0.6	-0.6	-3.2	-2.8
F4	black	99.6	1.5	15.8	17.2	0.5	0.8	-3.4	-2.9
A5	paper white	91.1	1.4	94.8	94.9	0.1	0.1	-4.3	-3.0
B5	Skin highlight L*=88	93.9	1.8	82.7	83.8	12.7	11.7	8.9	7.9
C5	Skin highlight L* =75	91.3	3.3	70.1	71.8	20.7	18.7	15.5	13.7
D5	Skin shadow L*=28	93.7	2.3	21.5	23.0	14.4	15.3	10.7	12.1
E5	Skin shadow L*=13	90.4	1.8	10.3	11.4	8.4	9.3	5.3	6.6
F5	Maximum Black	100.0	1.5	2.3	3.7	-0.2	-0.3	-0.9	-1.1
Summary Results		I* Color	I* tone	ΔE	80 Megalux hours				
Average Score for all patches		96.6	93.5	2.1					
Worst 10% (3 lowest scoring patches)		86.8	86.7	3.6					

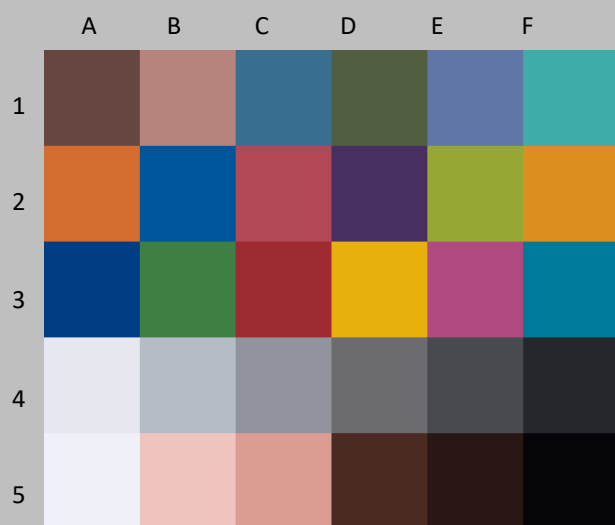


Original Print Colors before light exposure

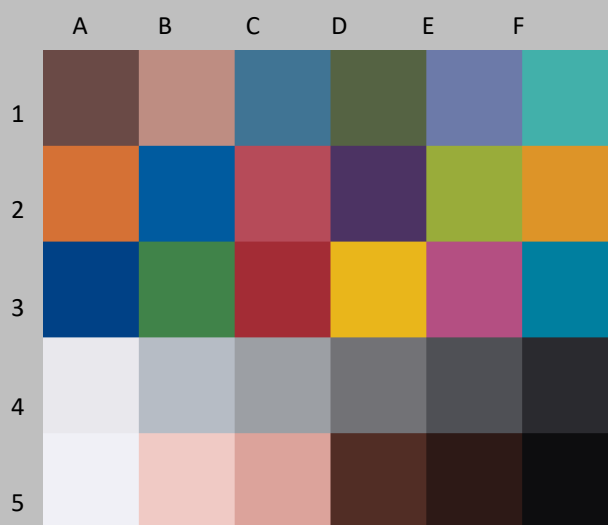


Colors After light exposure

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	98.7	2.2	32.6	34.7	12.0	12.3	7.8	8.4
B1	Light Skin	98.0	2.8	60.2	62.9	17.2	16.5	12.5	13.1
C1	Blue sky	98.6	2.4	44.4	46.6	-8.3	-7.7	-24.2	-23.6
D1	Foliage	100.0	2.0	38.0	40.0	-12.0	-11.9	16.2	16.4
E1	blue flower	93.3	3.5	49.6	52.1	4.0	4.6	-28.6	-26.2
F1	bluish green	99.8	1.5	64.4	65.8	-32.7	-32.6	-5.8	-6.4
A1	orange	97.5	2.5	57.1	58.5	35.9	34.1	50.6	49.6
B2	purplish blue	96.9	2.8	34.8	36.8	-0.1	-1.7	-46.3	-45.1
C2	moderate red	100.0	1.5	45.0	46.4	44.2	44.0	14.6	14.2
D2	purple	99.4	1.9	24.3	26.1	21.2	21.4	-24.5	-23.9
E2	yellow green	99.0	1.6	65.5	66.7	-22.4	-22.6	55.2	54.2
F2	orange yellow	97.3	2.9	65.2	66.9	20.8	18.6	65.0	64.1
A3	blue	96.5	2.6	23.9	25.3	1.8	-0.3	-48.7	-48.1
B3	green	99.2	1.3	48.1	49.2	-35.5	-35.2	26.3	25.5
C3	red	99.6	1.2	36.7	37.7	46.8	47.5	24.3	24.4
D3	yellow	97.4	3.1	74.5	76.3	7.3	5.0	76.5	75.4
E3	magenta	99.0	1.9	46.3	48.0	46.8	46.5	-10.3	-9.3
F3	cyan	98.4	2.4	46.0	48.1	-24.4	-23.9	-28.4	-27.4
A4	white	90.1	1.6	91.5	92.1	0.3	0.4	-3.9	-2.5
B4	neutral 8	99.2	0.6	75.8	76.0	-1.0	-1.2	-4.7	-5.2
C4	neutral 6.5	82.7	4.1	61.7	65.1	-0.4	-1.0	-5.3	-3.3
D4	neutral 5	99.6	2.3	45.9	48.1	-0.3	0.2	-2.4	-2.3
E4	neutral 3.5	100.0	2.3	31.8	34.0	-0.6	-0.5	-3.2	-2.9
F4	black	100.0	1.5	15.8	17.3	0.5	0.9	-3.4	-3.1
A5	paper white	90.8	1.4	94.8	95.1	0.1	0.2	-4.3	-2.9
B5	Skin highlight L*=88	91.3	2.3	82.7	84.0	12.7	11.8	8.9	7.3
C5	Skin highlight L*=75	89.6	3.7	70.1	71.9	20.7	18.7	15.5	13.1
D5	Skin shadow L*=28	92.5	2.4	21.5	22.9	14.4	15.4	10.7	12.3
E5	Skin shadow L*=13	87.2	2.1	10.3	11.3	8.4	9.4	5.3	6.8
F5	Maximum Black	100.0	1.6	2.3	3.9	-0.2	-0.2	-0.9	-1.2
Summary Results		I* Color	I* tone	ΔE	90 Megalux hours				
Average Score for all patches		96.4	93.5	2.2					
Worst 10% (3 lowest scoring patches)		86.5	86.8	3.8					

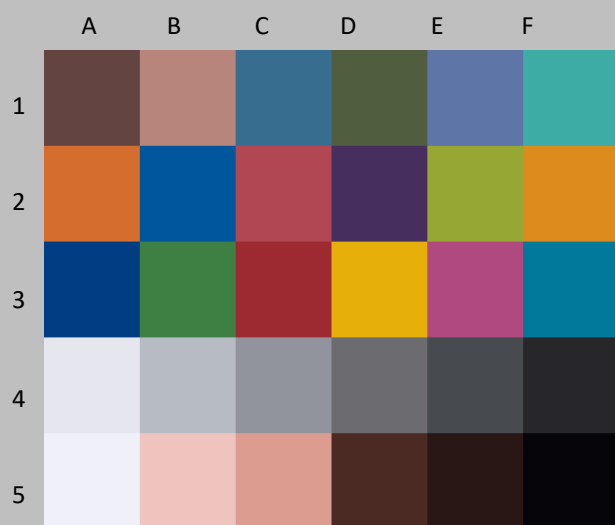


Original Print Colors before light exposure

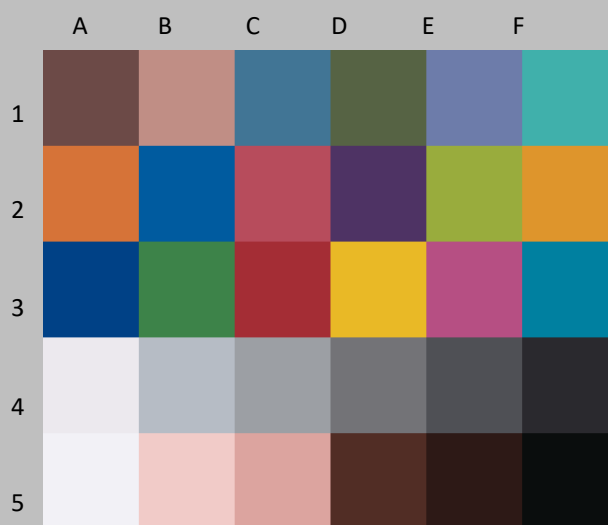


Colors After light exposure

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	98.6	2.4	32.6	34.9	12.0	12.4	7.8	8.4
B1	Light Skin	98.4	3.0	60.2	63.1	17.2	16.4	12.5	12.9
C1	Blue sky	97.6	2.7	44.4	46.8	-8.3	-7.7	-24.2	-23.2
D1	Foliage	100.0	2.2	38.0	40.2	-12.0	-11.8	16.2	16.3
E1	blue flower	91.9	4.0	49.6	52.3	4.0	4.5	-28.6	-25.8
F1	bluish green	99.7	1.6	64.4	65.9	-32.7	-32.5	-5.8	-6.4
A1	orange	96.9	2.9	57.1	58.6	35.9	34.0	50.6	49.1
B2	purplish blue	96.2	3.1	34.8	37.0	-0.1	-1.8	-46.3	-44.7
C2	moderate red	99.8	1.7	45.0	46.6	44.2	44.0	14.6	14.0
D2	purple	99.0	2.1	24.3	26.2	21.2	21.4	-24.5	-23.7
E2	yellow green	98.4	2.0	65.5	66.9	-22.4	-22.7	55.2	53.8
F2	orange yellow	96.6	3.4	65.2	67.1	20.8	18.4	65.0	63.4
A3	blue	96.1	2.9	23.9	25.6	1.8	-0.4	-48.7	-47.8
B3	green	98.8	1.6	48.1	49.3	-35.5	-35.1	26.3	25.4
C3	red	99.6	1.4	36.7	37.8	46.8	47.5	24.3	24.2
D3	yellow	96.5	3.8	74.5	76.5	7.3	4.8	76.5	74.6
E3	magenta	98.9	2.1	46.3	48.1	46.8	46.5	-10.3	-9.3
F3	cyan	97.6	2.7	46.0	48.3	-24.4	-24.0	-28.4	-27.1
A4	white	88.5	1.7	91.5	92.2	0.3	0.4	-3.9	-2.3
B4	neutral 8	100.0	0.4	75.8	76.0	-1.0	-1.2	-4.7	-5.0
C4	neutral 6.5	82.4	4.2	61.7	65.3	-0.4	-1.1	-5.3	-3.3
D4	neutral 5	98.5	2.6	45.9	48.4	-0.3	0.3	-2.4	-2.1
E4	neutral 3.5	100.0	2.5	31.8	34.2	-0.6	-0.4	-3.2	-2.9
F4	black	99.5	1.8	15.8	17.5	0.5	1.0	-3.4	-3.1
A5	paper white	88.5	1.6	94.8	95.1	0.1	0.2	-4.3	-2.7
B5	Skin highlight L*=88	87.0	2.9	82.7	84.2	12.7	11.8	8.9	6.6
C5	Skin highlight L*=75	87.1	4.3	70.1	72.1	20.7	18.6	15.5	12.3
D5	Skin shadow L*=28	93.4	2.4	21.5	23.2	14.4	15.4	10.7	12.1
E5	Skin shadow L*=13	86.3	2.3	10.3	11.6	8.4	9.4	5.3	6.9
F5	Maximum Black	100.0	1.9	2.3	4.2	-0.2	-0.2	-0.9	-1.1
Summary Results		I* Color	I* tone	ΔE	100 Megalux hours				
Average Score for all patches		95.7	93.0	2.5					
Worst 10% (3 lowest scoring patches)		85.2	86.2	4.2					

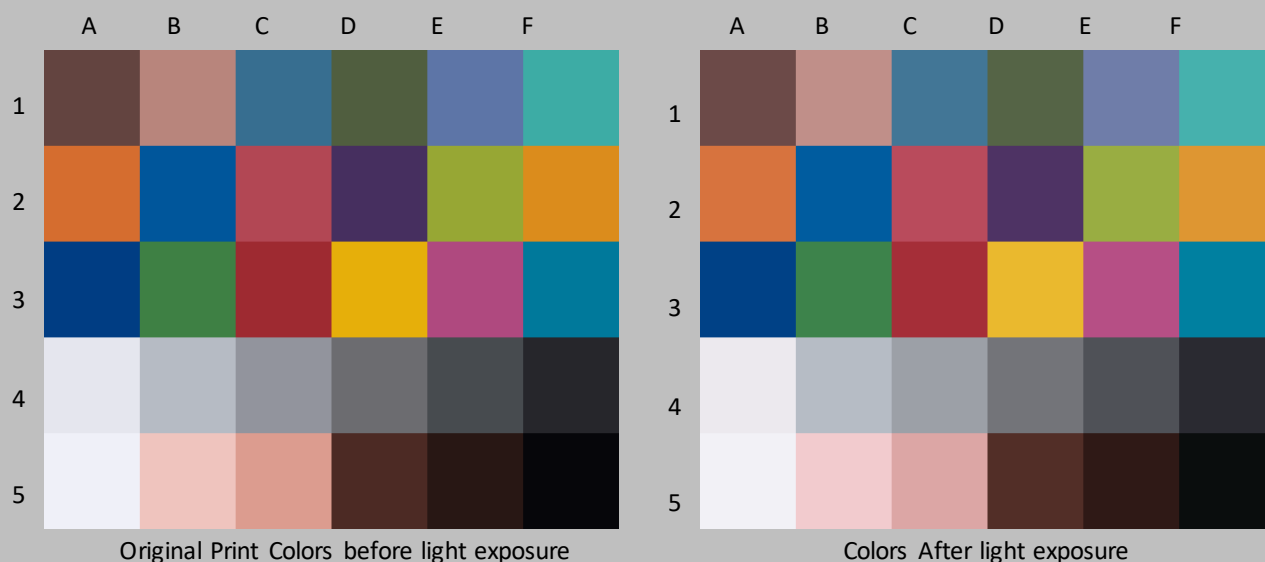


Original Print Colors before light exposure

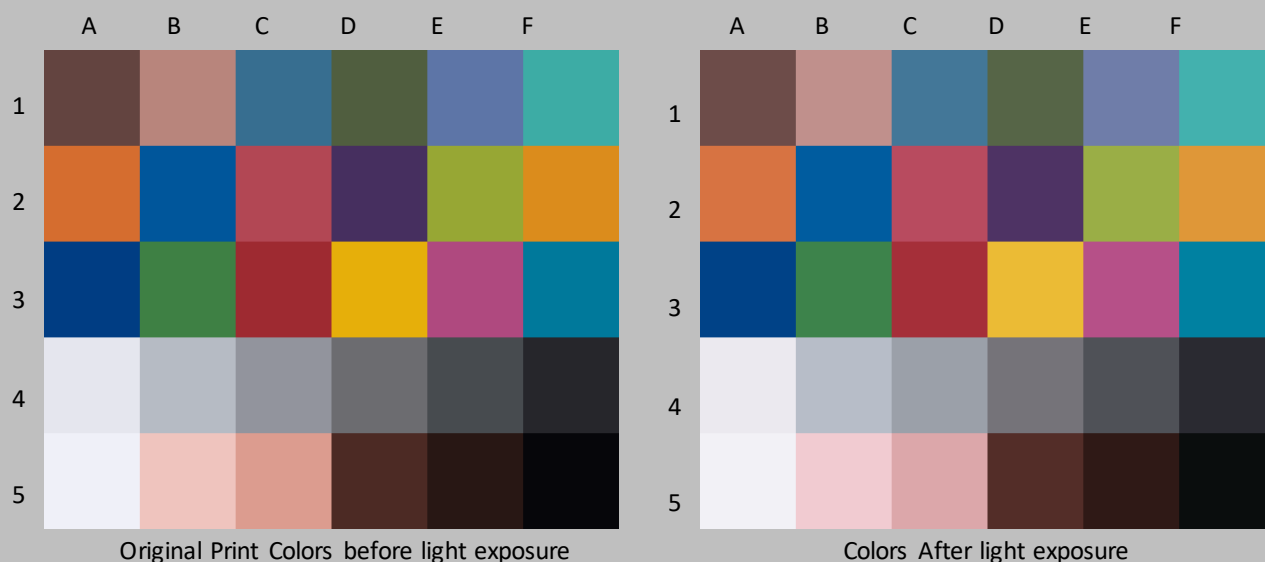


Colors After light exposure

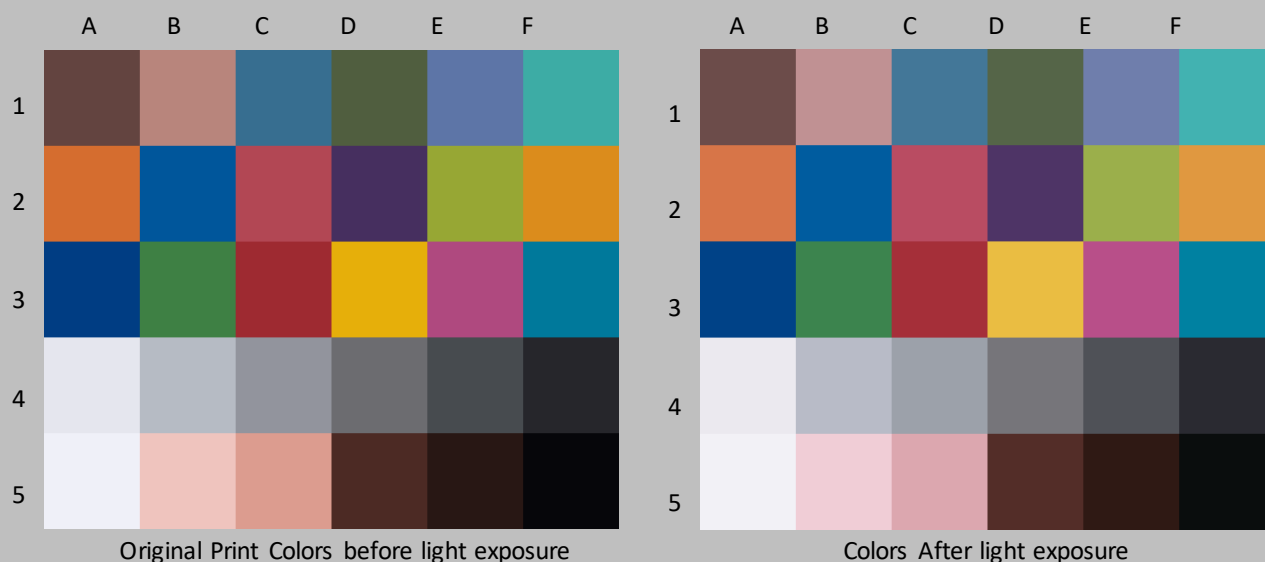
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	95.3	3.0	32.4	35.1	12.2	12.8	6.8	7.8
B1	Light Skin	98.8	3.3	60.2	63.4	17.6	16.8	12.0	11.9
C1	Blue sky	96.9	3.0	44.4	47.1	-8.3	-7.7	-24.2	-23.0
D1	Foliage	100.0	2.3	38.1	40.4	-11.8	-11.7	15.7	15.7
E1	blue flower	90.6	4.4	49.5	52.5	4.1	4.6	-28.9	-25.6
F1	bluish green	99.4	1.8	64.4	66.1	-32.7	-32.6	-6.0	-6.7
A2	orange	95.9	3.5	57.3	59.0	35.9	34.1	50.2	47.8
B2	purplish blue	95.7	3.4	34.8	37.0	0.2	-1.6	-46.3	-44.6
C2	moderate red	99.0	1.9	45.2	46.9	44.3	44.4	14.4	13.4
D2	purple	99.2	2.2	24.5	26.5	21.4	21.7	-24.7	-24.0
E2	yellow green	97.2	2.8	65.5	67.3	-22.4	-22.8	55.0	52.9
F2	orange yellow	95.7	4.0	65.6	67.6	20.9	18.4	64.6	62.2
A3	blue	95.8	3.0	24.0	25.6	1.9	-0.5	-48.6	-47.8
B3	green	97.9	2.0	48.0	49.4	-35.9	-35.6	26.3	24.9
C3	red	99.4	1.5	36.9	38.1	47.0	47.8	23.9	23.7
D3	yellow	96.0	4.2	75.1	77.3	7.1	4.5	75.9	73.5
E3	magenta	99.1	2.2	46.5	48.5	47.0	46.9	-10.4	-9.4
F3	cyan	97.3	2.9	46.0	48.5	-24.4	-24.2	-28.4	-26.9
A4	white	85.1	2.1	91.7	92.5	0.5	0.5	-3.9	-2.0
B4	neutral 8	100.0	0.4	75.9	76.2	-0.8	-1.0	-4.9	-5.1
C4	neutral 6.5	82.9	4.5	61.6	65.6	-0.2	-0.9	-5.4	-3.4
D4	neutral 5	98.2	2.9	45.8	48.6	-0.3	0.3	-2.7	-2.4
E4	neutral 3.5	100.0	2.6	31.7	34.2	-0.7	-0.5	-3.4	-3.3
F4	black	100.0	1.7	15.8	17.4	0.6	1.0	-3.6	-3.4
A5	paper white	82.1	2.2	94.8	95.3	0.1	0.2	-4.2	-2.0
B5	Skin highlight L*=88	85.2	3.2	83.3	84.8	12.7	12.2	8.9	6.1
C5	Skin highlight L*=75	82.5	5.6	70.1	72.5	20.8	19.0	15.9	11.1
D5	Skin shadow L*=28	92.8	2.5	21.5	23.3	14.3	15.4	10.4	11.8
E5	Skin shadow L*=13	82.0	2.6	10.4	11.7	8.2	9.3	5.1	7.1
F5	Maximum Black	100.0	1.1	2.4	3.4	-0.2	-0.4	-0.7	-1.0
Summary Results		I* Color	I* tone	ΔE	120 Megalux hours				
Average Score for all patches		94.7	92.6	2.8					
Worst 10% (3 lowest scoring patches)		82.2	85.3	4.9					



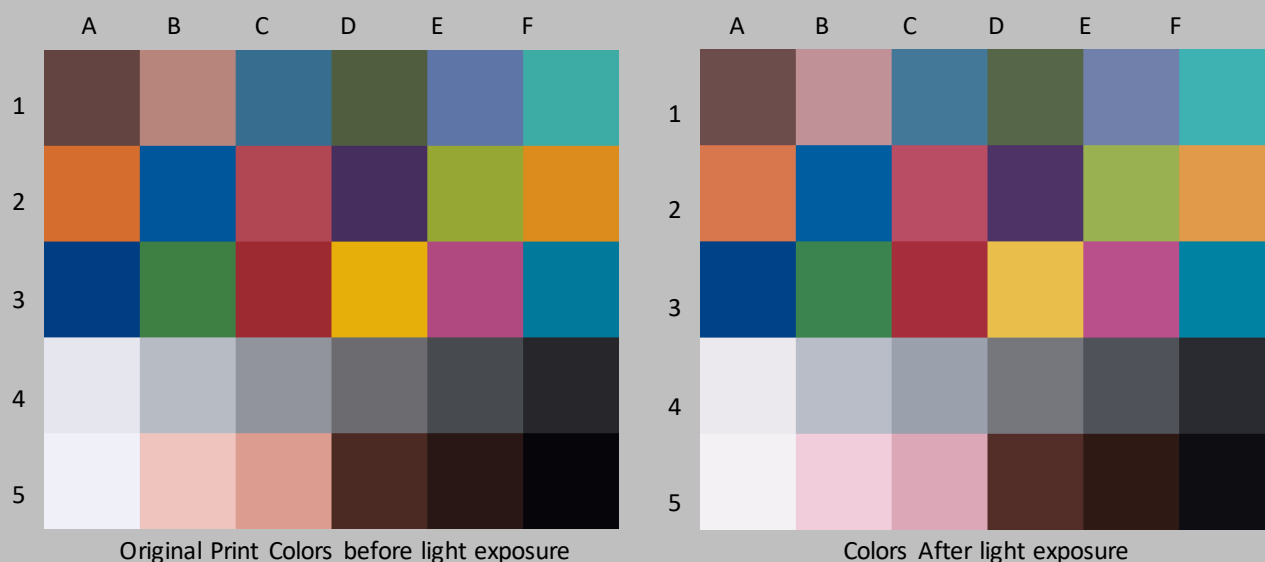
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.8	3.1	32.4	35.3	12.2	12.9	6.8	7.4
B1	Light Skin	94.4	4.0	60.2	63.8	17.6	16.9	12.0	10.5
C1	Blue sky	96.1	3.3	44.4	47.4	-8.3	-7.7	-24.2	-22.9
D1	Foliage	100.0	2.5	38.1	40.6	-11.8	-11.6	15.7	15.4
E1	blue flower	89.7	4.8	49.5	52.9	4.1	4.7	-28.9	-25.4
F1	bluish green	97.6	2.2	64.4	66.2	-32.7	-32.4	-6.0	-7.3
A1	orange	93.5	4.9	57.3	59.2	35.9	34.0	50.2	46.1
B2	purplish blue	95.4	3.5	34.8	37.2	0.2	-1.6	-46.3	-44.4
C2	moderate red	97.0	2.7	45.2	47.1	44.3	44.6	14.4	12.5
D2	purple	99.2	2.3	24.5	26.7	21.4	21.8	-24.7	-24.1
E2	yellow green	94.8	4.1	65.5	67.6	-22.4	-23.0	55.0	51.5
F2	orange yellow	93.3	5.6	65.6	68.0	20.9	18.2	64.6	60.3
A3	blue	95.8	3.0	24.0	25.7	1.9	-0.5	-48.6	-47.9
B3	green	96.6	2.5	48.0	49.5	-35.9	-35.6	26.3	24.4
C3	red	98.5	1.9	36.9	38.3	47.0	48.0	23.9	23.1
D3	yellow	93.2	6.3	75.1	77.8	7.1	4.0	75.9	71.1
E3	magenta	100.0	2.2	46.5	48.7	47.0	47.1	-10.4	-9.9
F3	cyan	97.1	3.2	46.0	48.7	-24.4	-24.2	-28.4	-26.8
A4	white	88.1	1.8	91.7	92.6	0.5	0.7	-3.9	-2.3
B4	neutral 8	99.9	0.6	75.9	76.2	-0.8	-0.7	-4.9	-5.3
C4	neutral 6.5	88.2	4.5	61.6	65.8	-0.2	-1.0	-5.4	-4.0
D4	neutral 5	97.3	3.2	45.8	48.9	-0.3	0.5	-2.7	-2.6
E4	neutral 3.5	100.0	2.8	31.7	34.4	-0.7	-0.3	-3.4	-3.6
F4	black	99.9	1.9	15.8	17.6	0.6	1.1	-3.6	-3.6
A5	paper white	81.0	2.4	94.8	95.3	0.1	0.2	-4.2	-1.9
B5	Skin highlight L*=88	70.0	5.4	83.3	85.0	12.7	12.7	8.9	3.7
C5	Skin highlight L*=75	73.1	8.0	70.1	72.8	20.8	19.2	15.9	8.5
D5	Skin shadow L*=28	93.8	2.5	21.5	23.4	14.3	15.5	10.4	11.5
E5	Skin shadow L*=13	81.2	2.6	10.4	11.6	8.2	9.7	5.1	6.9
F5	Maximum Black	96.6	1.4	2.4	3.6	-0.2	-0.2	-0.7	-1.5
Summary Results		I* Color	I* tone	ΔE	140 Megalux hours				
Average Score for all patches		93.3	91.8	3.3					
Worst 10% (3 lowest scoring patches)		74.7	84.5	6.6					



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	97.8	3.3	32.4	35.6	12.2	13.0	6.8	6.9
B1	Light Skin	87.3	5.1	60.2	64.2	17.6	17.1	12.0	8.9
C1	Blue sky	96.2	3.6	44.4	47.6	-8.3	-7.6	-24.2	-22.9
D1	Foliage	97.9	2.8	38.1	40.7	-11.8	-11.6	15.7	14.8
E1	blue flower	89.8	5.0	49.5	53.1	4.1	4.8	-28.9	-25.4
F1	bluish green	95.2	2.8	64.4	66.3	-32.7	-32.1	-6.0	-8.0
A1	orange	90.4	6.7	57.3	59.3	35.9	33.8	50.2	44.2
B2	purplish blue	95.1	3.7	34.8	37.2	0.2	-1.7	-46.3	-44.2
C2	moderate red	94.8	3.5	45.2	47.1	44.3	44.6	14.4	11.5
D2	purple	99.5	2.4	24.5	26.7	21.4	21.9	-24.7	-24.3
E2	yellow green	91.9	5.7	65.5	67.7	-22.4	-23.1	55.0	49.8
F2	orange yellow	90.0	7.7	65.6	68.1	20.9	17.8	64.6	57.9
A3	blue	95.7	3.1	24.0	25.7	1.9	-0.5	-48.6	-47.8
B3	green	95.3	3.0	48.0	49.6	-35.9	-35.6	26.3	23.7
C3	red	97.5	2.3	36.9	38.3	47.0	48.1	23.9	22.5
D3	yellow	90.1	8.6	75.1	78.1	7.1	3.6	75.9	68.6
E3	magenta	100.0	2.4	46.5	48.9	47.0	47.3	-10.4	-10.6
F3	cyan	97.2	3.3	46.0	48.9	-24.4	-24.2	-28.4	-26.9
A4	white	90.6	1.7	91.7	92.6	0.5	0.8	-3.9	-2.5
B4	neutral 8	96.7	0.9	75.9	76.3	-0.8	-0.6	-4.9	-5.6
C4	neutral 6.5	94.5	4.6	61.6	66.0	-0.2	-0.9	-5.4	-4.7
D4	neutral 5	95.8	3.5	45.8	49.2	-0.3	0.6	-2.7	-3.0
E4	neutral 3.5	97.8	3.0	31.7	34.6	-0.7	-0.2	-3.4	-3.9
F4	black	98.5	2.1	15.8	17.8	0.6	1.2	-3.6	-3.8
A5	paper white	80.3	2.4	94.8	95.3	0.1	0.2	-4.2	-1.9
B5	Skin highlight L*=88	56.6	7.5	83.3	85.2	12.7	13.1	8.9	1.7
C5	Skin highlight L*=75	63.9	10.4	70.1	73.1	20.8	19.5	15.9	6.0
D5	Skin shadow L*=28	93.9	2.6	21.5	23.5	14.3	15.6	10.4	11.3
E5	Skin shadow L*=13	78.5	2.9	10.4	11.6	8.2	9.7	5.1	7.2
F5	Maximum Black	98.8	1.3	2.4	3.6	-0.2	-0.3	-0.7	-1.3
Summary Results		I* Color	I* tone	ΔE	160 Megalux hours				
Average Score for all patches		91.6	91.1	3.9					
Worst 10% (3 lowest scoring patches)		66.4	83.7	8.9					



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.4	3.4	32.4	35.6	12.2	13.1	6.8	6.2
B1	Light Skin	74.9	7.3	60.2	64.6	17.6	17.3	12.0	6.2
C1	Blue sky	96.1	3.8	44.4	47.9	-8.3	-7.6	-24.2	-22.9
D1	Foliage	94.9	3.2	38.1	40.9	-11.8	-11.6	15.7	14.2
E1	blue flower	90.4	5.1	49.5	53.4	4.1	4.9	-28.9	-25.7
F1	bluish green	92.1	3.8	64.4	66.5	-32.7	-31.9	-6.0	-9.1
A1	orange	86.2	9.3	57.3	59.6	35.9	33.8	50.2	41.5
B2	purplish blue	95.2	3.7	34.8	37.4	0.2	-1.7	-46.3	-44.3
C2	moderate red	91.5	4.9	45.2	47.4	44.3	44.9	14.4	10.0
D2	purple	99.1	2.6	24.5	26.9	21.4	22.1	-24.7	-24.7
E2	yellow green	88.5	7.8	65.5	68.1	-22.4	-23.3	55.0	47.7
F2	orange yellow	85.6	10.7	65.6	68.5	20.9	17.7	64.6	54.8
A3	blue	95.7	3.1	24.0	25.8	1.9	-0.5	-48.6	-47.9
B3	green	93.7	3.7	48.0	49.8	-35.9	-35.7	26.3	23.0
C3	red	95.9	3.0	36.9	38.4	47.0	48.4	23.9	21.7
D3	yellow	85.7	11.9	75.1	78.5	7.1	3.2	75.9	65.2
E3	magenta	98.2	2.8	46.5	49.0	47.0	47.6	-10.4	-11.6
F3	cyan	97.4	3.4	46.0	49.0	-24.4	-24.2	-28.4	-27.0
A4	white	90.8	1.6	91.7	92.5	0.5	0.9	-3.9	-2.6
B4	neutral 8	93.8	1.1	75.9	76.3	-0.8	-0.4	-4.9	-5.9
C4	neutral 6.5	99.4	4.5	61.6	66.1	-0.2	-0.8	-5.4	-5.4
D4	neutral 5	92.7	3.8	45.8	49.3	-0.3	0.7	-2.7	-3.4
E4	neutral 3.5	94.9	3.1	31.7	34.7	-0.7	-0.2	-3.4	-4.2
F4	black	98.3	2.0	15.8	17.7	0.6	1.2	-3.6	-3.9
A5	paper white	77.7	2.7	94.8	95.2	0.1	0.2	-4.2	-1.6
B5	Skin highlight L*=88	42.7	9.6	83.3	85.3	12.7	13.5	8.9	-0.5
C5	Skin highlight L*=75	52.4	13.4	70.1	73.4	20.8	19.9	15.9	2.9
D5	Skin shadow L*=28	93.7	2.6	21.5	23.6	14.3	15.7	10.4	11.2
E5	Skin shadow L*=13	74.2	3.2	10.4	11.6	8.2	9.9	5.1	7.6
F5	Maximum Black	100.0	1.2	2.4	3.5	-0.2	-0.4	-0.7	-1.1
Summary Results		I* Color	I* tone	ΔE	180 Megalux hours				
Average Score for all patches		88.9	90.5	4.8					
Worst 10% (3 lowest scoring patches)		56.4	83.2	12.0					



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	93.7	3.8	32.4	35.9	12.2	13.1	6.8	5.7
B1	Light Skin	64.6	9.3	60.2	64.8	17.6	17.8	12.0	4.0
C1	Blue sky	95.3	4.1	44.4	48.1	-8.3	-7.6	-24.2	-22.7
D1	Foliage	91.9	3.7	38.1	41.1	-11.8	-11.5	15.7	13.6
E1	blue flower	89.8	5.5	49.5	53.8	4.1	5.0	-28.9	-25.5
F1	bluish green	89.3	4.7	64.4	66.7	-32.7	-31.6	-6.0	-9.9
A1	orange	81.9	12.0	57.3	60.0	35.9	33.9	50.2	38.7
B2	purplish blue	94.3	4.2	34.8	37.6	0.2	-1.8	-46.3	-43.9
C2	moderate red	88.5	6.3	45.2	47.7	44.3	45.1	14.4	8.6
D2	purple	98.7	2.8	24.5	27.1	21.4	22.2	-24.7	-24.9
E2	yellow green	84.4	10.2	65.5	68.6	-22.4	-23.3	55.0	45.3
F2	orange yellow	80.8	13.9	65.6	68.9	20.9	17.7	64.6	51.4
A3	blue	95.2	3.4	24.0	25.9	1.9	-0.8	-48.6	-47.8
B3	green	91.7	4.6	48.0	49.9	-35.9	-35.6	26.3	22.1
C3	red	94.3	3.9	36.9	38.6	47.0	48.6	23.9	20.7
D3	yellow	81.1	15.3	75.1	78.8	7.1	3.1	75.9	61.6
E3	magenta	96.8	3.4	46.5	49.3	47.0	47.8	-10.4	-12.3
F3	cyan	96.9	3.7	46.0	49.2	-24.4	-24.2	-28.4	-26.8
A4	white	86.7	2.0	91.7	92.6	0.5	0.8	-3.9	-2.1
B4	neutral 8	93.3	1.2	75.9	76.3	-0.8	-0.3	-4.9	-5.8
C4	neutral 6.5	98.3	4.7	61.6	66.2	-0.2	-0.6	-5.4	-6.0
D4	neutral 5	89.5	4.2	45.8	49.6	-0.3	0.8	-2.7	-3.8
E4	neutral 3.5	92.5	3.4	31.7	34.9	-0.7	-0.1	-3.4	-4.4
F4	black	96.3	2.3	15.8	17.9	0.6	1.3	-3.6	-4.1
A5	paper white	72.0	3.2	94.8	95.3	0.1	0.1	-4.2	-1.1
B5	Skin highlight L*=88	32.6	11.2	83.3	85.5	12.7	13.9	8.9	-2.0
C5	Skin highlight L*=75	41.2	16.3	70.1	73.6	20.8	20.6	15.9	0.0
D5	Skin shadow L*=28	94.1	2.6	21.5	23.7	14.3	15.8	10.4	10.8
E5	Skin shadow L*=13	73.1	3.3	10.4	11.6	8.2	10.0	5.1	7.7
F5	Maximum Black	95.7	2.0	2.4	4.1	-0.2	-0.3	-0.7	-1.6
Summary Results		I* Color	I* tone	200 Megalux hours					
Average Score for all patches		85.8	89.7						
Worst 10% (3 lowest scoring patches)		46.1	82.6						

Section III: Light Induced Low-intensity Staining Test Results

This section presents test results for samples that are retired from the light fade testing unit to dark storage (0 lux, ~21°C, 50% RH) at five discreet exposure intervals (0 luxhrs, i.e., the dark storage control sample, 20 Mluxhrs, 50 Mluxhrs, 100 Mluxhrs, and 200 Mluxhrs). All of the sample image targets were printed at the same time on the same sheet of media to ensure maximum uniformity of the sample set. Also, reference measurements were initially made for each individual target to account for any minor printer output variations within the complete sample set. The retired targets undergo a series of remeasurements at specified intervals (6 months, 1 year, 2 years, etc.) from the time each sample was retired to dark storage. I* color and tonal accuracy scores and Conservation Display ratings decrease while Δb^* values increase if the media shows ongoing light-induced post-exposure yellowing. The dark storage control sample (see section IV) reveals if any humidity-induced colorant shifts, thermal aging, and/or gas contamination is also contributing to color appearance changes over time.

AaI 30 Patch Color Target

I* Color (Average) Summary

Light Exposure (Mluxhrs)	Years of Dark Storage Time after exposure						
	0	0.5	1	2	3	4	5
0	100.0	99.7	99.7	99.6	99.3	99.1	
20	98.9	95.7	93.5	89.9	88.2	86.6	
50	97.7	91.8	88.0	82.0	77.1		
100	95.7	85.5	82.1	74.8	69.9		

values in red exceed Conservation Display Rating Upper limit

I* Color (Worst 10%) Summary

Light Exposure (Mluxhrs)	Years of Dark Storage Time after exposure						
	0	0.5	1	2	3	4	5
0	100.0	97.5	97.5	96.7	95.2	94.1	
20	94.1	80.2	70.3	54.6	46.9	41.3	
50	88.9	64.2	48.8	24.5	6.9		
100	85.2	33.7	20.3	-8.1	-25.3		

values in red exceed Conservation Display Rating Lower limit

I* Tone (Average) Summary

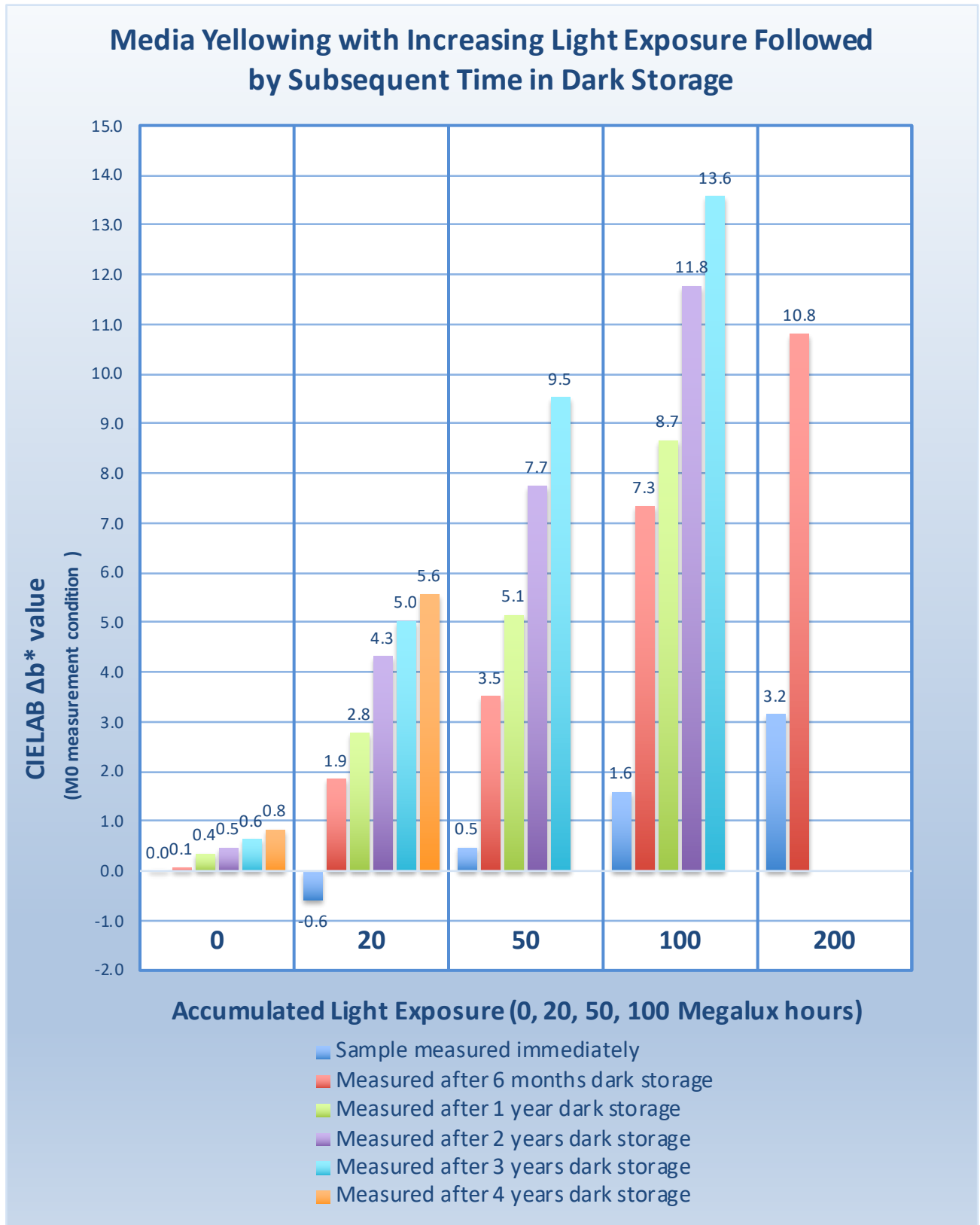
Dark Storage control sample, no light	Years of Dark Storage Time after exposure						
	0	0.5	1	2	3	4	5
0	100.0	98.3	97.9	97.9	97.9	97.9	
20	97.1	96.5	96.5	96.6	96.5	96.3	
50	95.1	95.0	95.0	95.0	94.9		
100	93.0	93.2	93.3	93.2	93.1		

values in red exceed Conservation Display Rating Upper limit

I* Tone (Worst 10%) Summary

Light Exposure (Mluxhrs)	Years of Dark Storage Time after exposure						
	0	0.5	1	2	3	4	5
0	100.0	95.9	95.7	95.6	95.6	96.3	
20	92.6	92.6	92.7	93.4	93.3	92.8	
50	87.8	88.9	89.3	89.4	89.3		
100	86.2	86.6	86.6	86.3	86.2		

values in red exceed Conservation Display Rating Lower limit



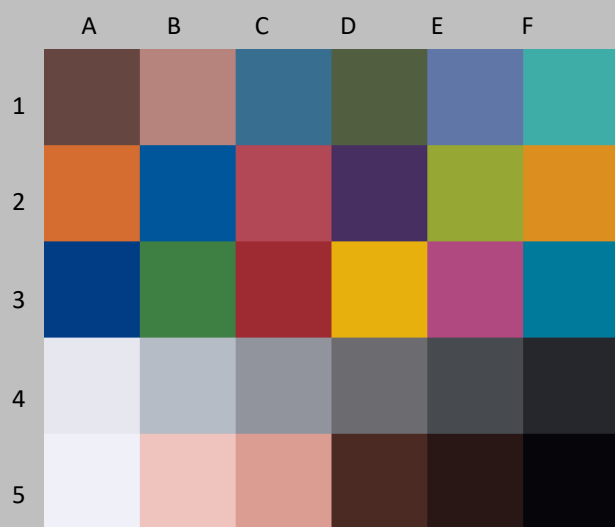


Original Print Colors before light exposure

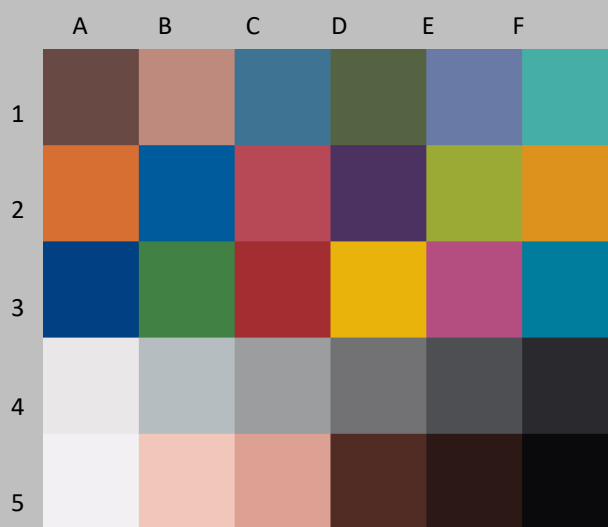


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.9	1.5	32.9	34.1	12.2	12.2	7.8	8.7
B1	Light Skin	93.6	2.2	60.2	61.4	17.2	16.6	12.5	14.3
C1	Blue sky	99.3	1.4	44.6	45.8	-8.2	-8.8	-24.1	-23.8
D1	Foliage	98.2	1.6	38.3	39.7	-11.8	-12.1	16.1	16.9
E1	blue flower	97.4	1.7	49.7	50.8	4.3	3.9	-28.8	-27.6
F1	bluish green	97.0	1.7	64.6	65.4	-32.4	-32.9	-6.1	-4.7
A1	orange	98.9	1.3	57.3	57.9	35.8	34.6	50.1	50.4
B2	purplish blue	95.6	2.8	35.0	36.2	0.1	-2.0	-46.5	-45.0
C2	moderate red	98.6	1.4	45.1	45.8	44.2	43.8	14.1	15.2
D2	purple	98.6	1.3	24.6	25.5	21.4	21.1	-24.6	-23.7
E2	yellow green	100.0	0.6	65.9	66.2	-22.3	-22.2	54.9	55.3
F2	orange yellow	99.0	1.3	65.7	66.2	20.7	19.6	64.8	65.0
A3	blue	97.1	2.1	24.2	25.0	2.0	0.2	-48.9	-48.1
B3	green	100.0	0.7	48.4	49.1	-35.4	-35.3	26.3	26.5
C3	red	99.6	0.9	37.0	37.5	46.8	46.9	24.1	24.8
D3	yellow	99.7	0.8	75.2	75.5	6.8	6.0	75.6	75.7
E3	magenta	97.6	1.8	46.8	47.5	47.1	46.3	-10.2	-8.7
F3	cyan	99.7	1.1	46.2	47.1	-24.4	-24.5	-28.5	-27.9
A4	white	79.6	2.4	91.8	91.7	0.4	0.0	-4.1	-1.7
B4	neutral 8	96.4	0.9	75.9	76.1	-1.0	-1.6	-4.9	-4.3
C4	neutral 6.5	75.2	3.3	61.8	63.3	-0.2	-0.5	-5.4	-2.5
D4	neutral 5	94.8	1.6	46.1	47.4	-0.1	-0.7	-2.5	-1.7
E4	neutral 3.5	95.5	1.7	32.0	33.3	-0.5	-0.9	-3.3	-2.5
F4	black	99.4	1.1	15.9	16.9	0.5	0.4	-3.6	-3.1
A5	paper white	85.6	1.9	94.8	94.8	0.1	-0.2	-4.5	-2.6
B5	Skin highlight L*=88	91.3	1.8	83.4	83.5	12.5	12.0	8.6	10.4
C5	Skin highlight L*=75	95.4	1.9	70.3	71.2	20.6	19.1	15.5	16.3
D5	Skin shadow L*=28	96.6	1.4	21.6	22.5	14.4	14.7	10.6	11.6
E5	Skin shadow L*=13	94.0	1.2	10.6	11.1	8.2	8.5	4.9	5.9
F5	Maximum Black	100.0	0.5	2.6	3.0	-0.2	-0.4	-1.0	-0.8
Summary Results		I* Color	I* tone	ΔE	20 Mluxhrs + 6 months				
Average Score for all patches		95.7	96.5	1.5					
Worst 10% (3 lowest scoring patches)		80.2	92.6	2.8					

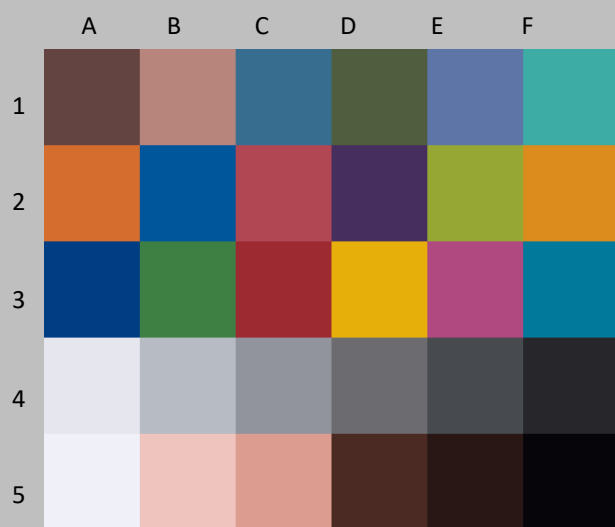


Original Print Colors before light exposure



Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	92.6	2.3	32.9	34.5	12.0	12.3	8.0	9.5
B1	Light Skin	89.1	3.5	60.1	62.2	17.2	16.5	12.4	15.1
C1	Blue sky	96.6	2.2	44.6	46.2	-8.2	-8.3	-24.0	-22.7
D1	Foliage	95.9	2.1	38.3	39.9	-11.9	-11.9	16.1	17.4
E1	blue flower	90.6	3.7	49.7	51.6	4.2	4.1	-28.6	-25.4
F1	bluish green	97.0	1.9	64.6	65.7	-32.6	-32.9	-5.9	-4.4
A1	orange	98.3	1.9	57.1	58.1	35.9	34.6	50.0	50.9
B2	purplish blue	94.0	3.6	35.0	36.6	0.1	-2.3	-46.2	-44.0
C2	moderate red	97.6	2.0	45.2	46.3	44.2	43.9	13.9	15.5
D2	purple	96.0	2.3	24.6	25.9	21.5	21.1	-24.5	-22.8
E2	yellow green	99.6	1.1	65.7	66.5	-22.4	-22.2	55.0	55.7
F2	orange yellow	98.2	2.1	65.4	66.5	20.8	19.4	64.6	65.6
A3	blue	94.6	3.4	24.1	25.3	2.0	-0.7	-48.8	-47.2
B3	green	100.0	1.0	48.4	49.2	-35.4	-35.0	26.4	26.8
C3	red	98.0	1.8	36.8	37.6	46.8	47.4	24.0	25.4
D3	yellow	98.7	1.9	74.7	75.8	7.1	5.9	76.2	77.0
E3	magenta	95.5	3.0	46.5	47.8	47.0	46.4	-10.4	-7.8
F3	cyan	96.4	2.4	46.1	47.6	-24.4	-24.5	-28.5	-26.7
A4	white	61.7	4.1	91.7	91.9	0.3	-0.2	-3.9	0.2
B4	neutral 8	86.4	1.8	75.9	76.1	-0.9	-1.7	-4.8	-3.2
C4	neutral 6.5	62.7	5.0	61.7	64.5	-0.3	-1.0	-5.4	-1.4
D4	neutral 5	93.2	2.2	46.0	47.8	-0.2	-0.1	-2.4	-1.3
E4	neutral 3.5	92.4	2.2	31.9	33.8	-0.6	-0.7	-3.2	-2.0
F4	black	96.4	1.5	15.9	17.1	0.6	0.8	-3.6	-2.8
A5	paper white	68.1	3.5	94.8	94.9	0.1	-0.3	-4.3	-0.8
B5	Skin highlight L*=88	87.0	2.6	82.8	83.5	12.7	11.6	8.8	11.0
C5	Skin highlight L* =75	93.9	2.5	70.1	71.5	20.7	18.8	15.5	16.1
D5	Skin shadow L*=28	92.9	2.2	21.4	22.8	14.5	15.1	10.7	12.4
E5	Skin shadow L*=13	91.0	1.8	10.3	11.4	8.4	8.9	5.2	6.5
F5	Maximum Black	100.0	0.7	2.4	3.1	-0.2	-0.3	-0.8	-1.0
Summary Results		I* Color	I* tone	ΔE	50 Mluxhrs + 6 months				
Average Score for all patches		91.8	95.0	2.4					
Worst 10% (3 lowest scoring patches)		64.2	88.9	4.3					

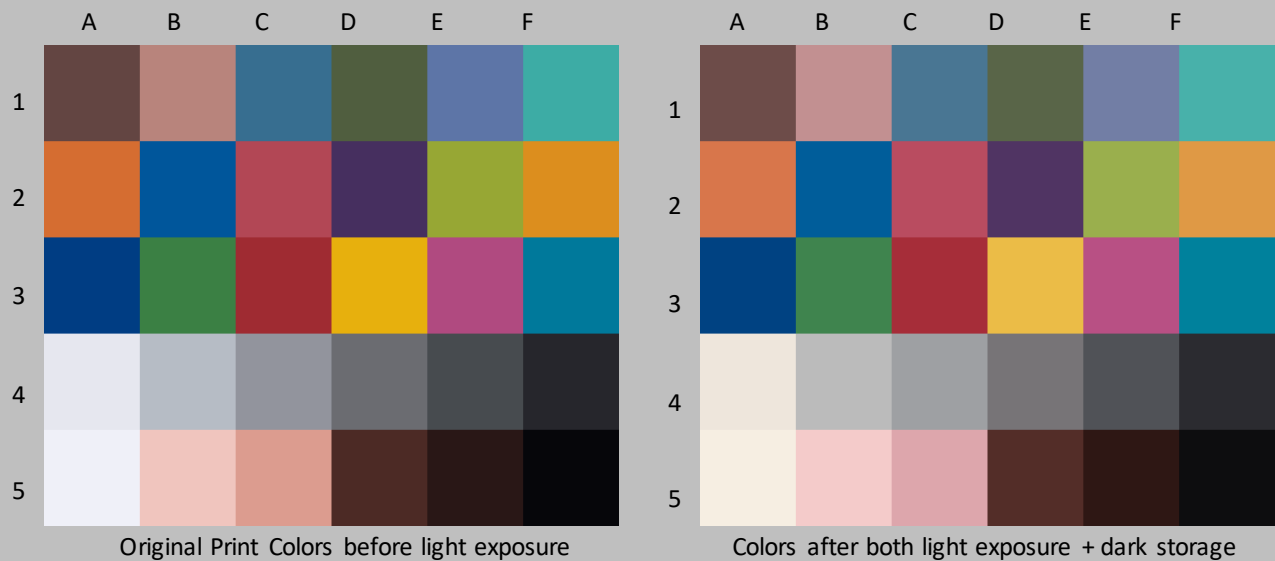


Original Print Colors before light exposure



Colors after both light exposure + dark storage

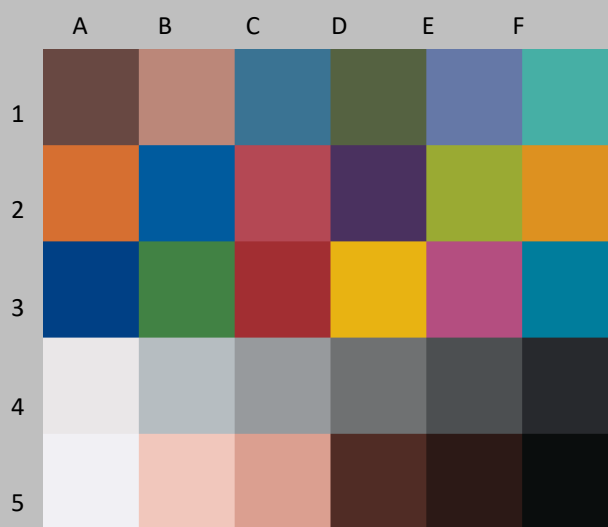
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	93.0	2.5	32.6	34.6	12.0	12.4	7.8	9.3
B1	Light Skin	89.1	4.0	60.2	63.0	17.2	16.4	12.5	15.2
C1	Blue sky	87.7	4.3	44.4	46.6	-8.3	-8.5	-24.2	-20.5
D1	Foliage	97.5	2.3	38.0	40.0	-12.0	-11.6	16.2	17.2
E1	blue flower	80.3	6.7	49.6	52.1	4.0	3.6	-28.6	-22.4
F1	bluish green	94.6	2.6	64.4	65.7	-32.7	-33.0	-5.8	-3.6
A1	orange	98.1	2.3	57.1	58.6	35.9	34.3	50.6	49.9
B2	purplish blue	89.3	5.8	34.8	36.7	-0.1	-3.5	-46.3	-41.9
C2	moderate red	98.6	1.9	45.0	46.6	44.2	44.0	14.6	15.7
D2	purple	93.6	3.1	24.3	26.1	21.2	20.8	-24.5	-22.0
E2	yellow green	99.5	1.5	65.5	66.8	-22.4	-22.1	55.2	54.5
F2	orange yellow	97.5	2.8	65.2	67.1	20.8	18.9	65.0	64.1
A3	blue	90.8	5.1	23.9	25.2	1.8	-2.1	-48.7	-45.7
B3	green	99.6	1.2	48.1	49.1	-35.5	-34.8	26.3	26.2
C3	red	98.7	1.7	36.7	37.8	46.8	47.6	24.3	25.2
D3	yellow	97.6	3.0	74.5	76.4	7.3	5.3	76.5	75.2
E3	magenta	92.9	4.3	46.3	48.0	46.8	46.0	-10.3	-6.4
F3	cyan	89.8	4.7	46.0	47.9	-24.4	-25.1	-28.4	-24.2
A4	white	24.4	7.7	91.5	91.7	0.3	-0.4	-3.9	3.7
B4	neutral 8	61.2	4.2	75.8	75.6	-1.0	-1.8	-4.7	-0.6
C4	neutral 6.5	49.0	6.4	61.7	65.1	-0.4	-1.5	-5.3	-0.1
D4	neutral 5	80.3	3.3	45.9	48.2	-0.3	0.1	-2.4	0.0
E4	neutral 3.5	88.9	2.8	31.8	34.0	-0.6	-0.5	-3.2	-1.6
F4	black	94.1	1.8	15.8	17.3	0.5	0.9	-3.4	-2.4
A5	paper white	27.7	7.4	94.8	94.7	0.1	-0.6	-4.3	3.0
B5	Skin highlight L*=88	84.0	3.2	82.7	83.8	12.7	11.4	8.9	11.6
C5	Skin highlight L*=75	93.4	2.9	70.1	71.9	20.7	18.5	15.5	15.5
D5	Skin shadow L*=28	90.9	2.7	21.5	23.0	14.4	15.5	10.7	12.6
E5	Skin shadow L*=13	83.3	2.4	10.3	11.4	8.4	9.6	5.3	7.2
F5	Maximum Black	100.0	1.6	2.3	3.8	-0.2	-0.3	-0.9	-1.1
Summary Results		I* Color	I* tone	ΔE	100 Mluxhrs + 6 months				
Average Score for all patches		85.5	93.2	3.5					
Worst 10% (3 lowest scoring patches)		33.7	86.6	7.3					



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.6	3.3	32.4	35.6	12.2	13.1	6.8	7.1
B1	Light Skin	80.5	6.4	60.2	64.6	17.6	17.5	12.0	7.4
C1	Blue sky	84.1	5.7	44.4	47.8	-8.3	-8.5	-24.2	-19.7
D1	Foliage	98.1	3.0	38.1	41.0	-11.8	-11.4	15.7	14.9
E1	blue flower	77.2	8.2	49.5	53.5	4.1	3.9	-28.9	-21.7
F1	bluish green	100.0	2.0	64.4	66.4	-32.7	-32.3	-6.0	-6.2
A1	orange	84.5	10.4	57.3	59.8	35.9	34.2	50.2	40.3
B2	purplish blue	87.5	6.7	34.8	37.2	0.2	-3.4	-46.3	-41.2
C2	moderate red	93.0	4.4	45.2	47.5	44.3	45.1	14.4	10.7
D2	purple	96.0	3.1	24.5	26.9	21.4	21.6	-24.7	-22.9
E2	yellow green	86.9	8.7	65.5	68.3	-22.4	-22.7	55.0	46.7
F2	orange yellow	83.1	12.4	65.6	68.7	20.9	18.2	64.6	52.9
A3	blue	90.6	5.4	24.0	25.7	1.9	-2.3	-48.6	-45.8
B3	green	94.1	3.6	48.0	49.8	-35.9	-35.5	26.3	23.2
C3	red	96.4	2.9	36.9	38.6	47.0	48.6	23.9	22.1
D3	yellow	83.2	13.7	75.1	78.5	7.1	3.8	75.9	63.1
E3	magenta	97.9	3.0	46.5	49.2	47.0	47.2	-10.4	-8.9
F3	cyan	88.1	5.8	46.0	48.9	-24.4	-25.5	-28.4	-23.6
A4	white	2.8	9.7	91.7	91.9	0.5	-0.2	-3.9	5.8
B4	neutral 8	49.8	5.3	75.9	75.8	-0.8	-1.2	-4.9	0.4
C4	neutral 6.5	62.6	5.9	61.6	65.9	-0.2	-1.3	-5.4	-1.5
D4	neutral 5	87.8	4.0	45.8	49.4	-0.3	0.5	-2.7	-1.3
E4	neutral 3.5	98.4	3.1	31.7	34.7	-0.7	-0.3	-3.4	-2.9
F4	black	98.1	2.2	15.8	17.8	0.6	1.2	-3.6	-3.3
A5	paper white	(8.8)	10.8	94.8	94.6	0.1	-0.8	-4.2	6.6
B5	Skin highlight L*=88	82.0	3.7	83.3	84.9	12.7	12.8	8.9	5.6
C5	Skin highlight L*=75	61.7	11.0	70.1	73.2	20.8	19.8	15.9	5.4
D5	Skin shadow L*=28	92.5	2.7	21.5	23.6	14.3	15.8	10.4	11.5
E5	Skin shadow L*=13	74.6	3.2	10.4	11.5	8.2	10.0	5.1	7.5
F5	Maximum Black	97.4	1.9	2.4	4.2	-0.2	-0.4	-0.7	-1.4
Summary Results		I* Color	I* tone	ΔE	200 Mluxhrs + 6 months				
Average Score for all patches		80.6	89.9	5.7					
Worst 10% (3 lowest scoring patches)		14.6	82.3	12.4					

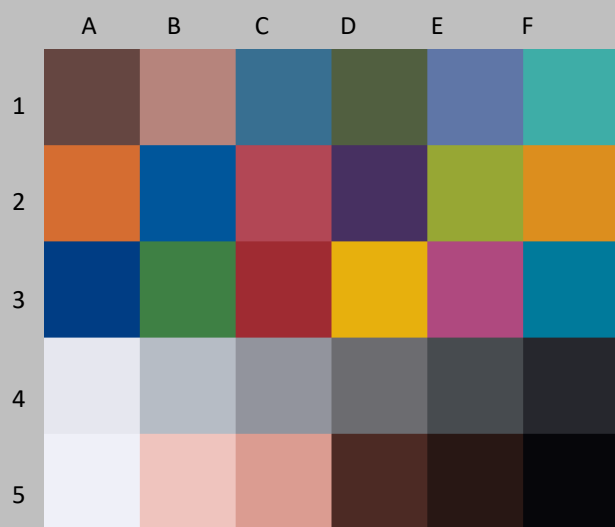


Original Print Colors before light exposure

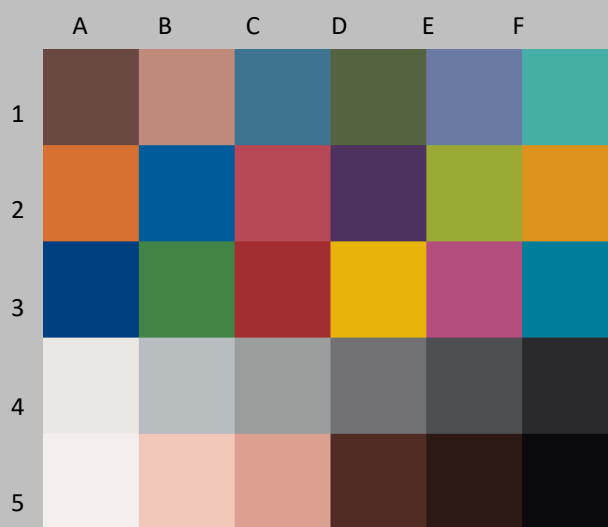


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	93.7	1.9	32.9	34.2	12.2	12.2	7.8	9.2
B1	Light Skin	91.5	2.6	60.2	61.3	17.2	16.7	12.5	14.8
C1	Blue sky	97.9	1.6	44.6	45.8	-8.2	-8.9	-24.1	-23.3
D1	Foliage	97.5	1.7	38.3	39.7	-11.8	-11.9	16.1	17.1
E1	blue flower	95.2	2.2	49.7	50.8	4.3	3.8	-28.8	-27.0
F1	bluish green	95.6	2.1	64.6	65.4	-32.4	-32.9	-6.1	-4.2
A1	orange	98.9	1.4	57.3	58.0	35.8	34.8	50.1	50.7
B2	purplish blue	94.7	3.2	35.0	36.3	0.1	-2.2	-46.5	-44.6
C2	moderate red	97.8	1.7	45.1	45.9	44.2	43.9	14.1	15.6
D2	purple	97.3	1.7	24.6	25.7	21.4	21.0	-24.6	-23.3
E2	yellow green	99.7	0.8	65.9	66.4	-22.3	-22.0	54.9	55.6
F2	orange yellow	99.0	1.3	65.7	66.3	20.7	19.7	64.8	65.4
A3	blue	96.4	2.5	24.2	25.1	2.0	0.0	-48.9	-47.7
B3	green	99.9	0.9	48.4	49.2	-35.4	-35.2	26.3	26.7
C3	red	99.1	1.2	37.0	37.6	46.8	47.0	24.1	25.1
D3	yellow	99.7	0.9	75.2	75.6	6.8	6.1	75.6	76.0
E3	magenta	96.4	2.4	46.8	47.7	47.1	46.3	-10.2	-8.0
F3	cyan	98.2	1.5	46.2	47.2	-24.4	-24.7	-28.5	-27.3
A4	white	67.0	3.6	91.8	91.7	0.4	-0.1	-4.1	-0.5
B4	neutral 8	88.8	1.6	75.9	76.2	-1.0	-1.7	-4.9	-3.5
C4	neutral 6.5	67.9	3.9	61.8	63.4	-0.2	-0.5	-5.4	-1.8
D4	neutral 5	91.2	1.9	46.1	47.4	-0.1	-0.6	-2.5	-1.3
E4	neutral 3.5	92.7	1.9	32.0	33.5	-0.5	-0.8	-3.3	-2.1
F4	black	98.2	1.3	15.9	17.0	0.5	0.5	-3.6	-2.9
A5	paper white	75.8	2.8	94.8	94.7	0.1	-0.3	-4.5	-1.7
B5	Skin highlight L*=88	85.6	2.7	83.4	83.5	12.5	11.9	8.6	11.2
C5	Skin highlight L* =75	93.9	2.2	70.3	71.2	20.6	19.1	15.5	16.9
D5	Skin shadow L*=28	96.9	1.5	21.6	22.6	14.4	14.7	10.6	11.6
E5	Skin shadow L*=13	97.2	1.1	10.6	11.4	8.2	8.5	4.9	5.5
F5	Maximum Black	100.0	0.8	2.6	3.3	-0.2	-0.1	-1.0	-1.0
Summary Results		I* Color	I* tone	ΔE	20 Mluxhrs + 1 year				
Average Score for all patches		93.5	96.5	1.9					
Worst 10% (3 lowest scoring patches)		70.3	92.7	3.6					

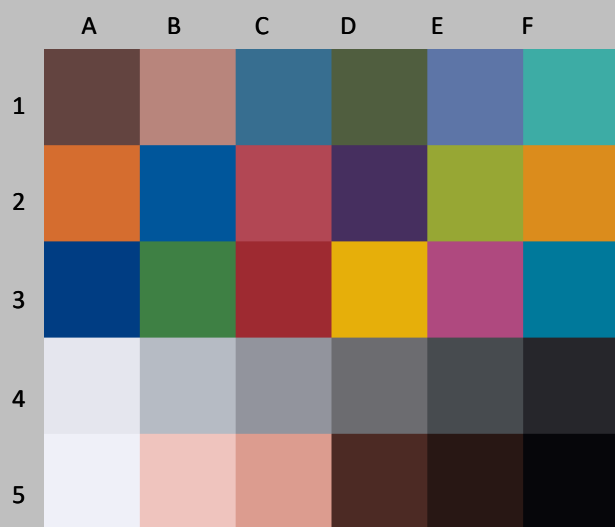


Original Print Colors before light exposure



Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	91.0	2.5	32.9	34.6	12.0	12.4	8.0	9.7
B1	Light Skin	85.1	4.2	60.1	62.3	17.2	16.5	12.4	16.0
C1	Blue sky	93.2	2.8	44.6	46.2	-8.2	-8.5	-24.0	-21.8
D1	Foliage	95.0	2.3	38.3	40.0	-11.9	-11.8	16.1	17.6
E1	blue flower	86.5	4.8	49.7	51.6	4.2	3.8	-28.6	-24.2
F1	bluish green	94.3	2.6	64.6	65.7	-32.6	-33.1	-5.9	-3.6
A1	orange	98.1	2.0	57.1	58.3	35.9	34.7	50.0	51.2
B2	purplish blue	91.4	4.7	35.0	36.5	0.1	-2.9	-46.2	-42.9
C2	moderate red	96.1	2.6	45.2	46.4	44.2	43.9	13.9	16.2
D2	purple	94.0	2.8	24.6	26.0	21.5	20.9	-24.5	-22.1
E2	yellow green	99.3	1.3	65.7	66.5	-22.4	-22.1	55.0	55.9
F2	orange yellow	98.0	2.2	65.4	66.6	20.8	19.5	64.6	65.9
A3	blue	92.6	4.2	24.1	25.2	2.0	-1.4	-48.8	-46.4
B3	green	99.6	1.1	48.4	49.3	-35.4	-35.0	26.4	27.0
C3	red	97.5	2.1	36.8	37.7	46.8	47.3	24.0	25.7
D3	yellow	98.7	1.9	74.7	75.9	7.1	6.0	76.2	77.1
E3	magenta	93.3	4.0	46.5	47.8	47.0	46.2	-10.4	-6.7
F3	cyan	93.7	3.2	46.1	47.6	-24.4	-24.9	-28.5	-25.7
A4	white	43.2	5.9	91.7	91.8	0.3	-0.4	-3.9	1.9
B4	neutral 8	73.0	3.1	75.9	76.0	-0.9	-1.8	-4.8	-1.9
C4	neutral 6.5	52.3	5.8	61.7	64.5	-0.3	-1.2	-5.4	-0.4
D4	neutral 5	85.7	2.6	46.0	47.8	-0.2	-0.1	-2.4	-0.6
E4	neutral 3.5	88.6	2.5	31.9	33.8	-0.6	-0.7	-3.2	-1.7
F4	black	94.3	1.6	15.9	17.2	0.6	0.8	-3.6	-2.6
A5	paper white	50.9	5.2	94.8	94.9	0.1	-0.5	-4.3	0.8
B5	Skin highlight L*=88	79.4	3.8	82.8	83.5	12.7	11.6	8.8	12.3
C5	Skin highlight L* =75	92.1	2.9	70.1	71.6	20.7	18.8	15.5	17.1
D5	Skin shadow L*=28	93.0	2.3	21.4	22.9	14.5	15.0	10.7	12.4
E5	Skin shadow L*=13	89.9	1.8	10.3	11.3	8.4	9.1	5.2	6.5
F5	Maximum Black	100.0	0.6	2.4	3.0	-0.2	-0.2	-0.8	-1.1
Summary Results		I* Color	I* tone	ΔE	50 Mluxhrs + 1 year				
Average Score for all patches		88.0	95.0	3.0					
Worst 10% (3 lowest scoring patches)		48.8	89.3	5.6					

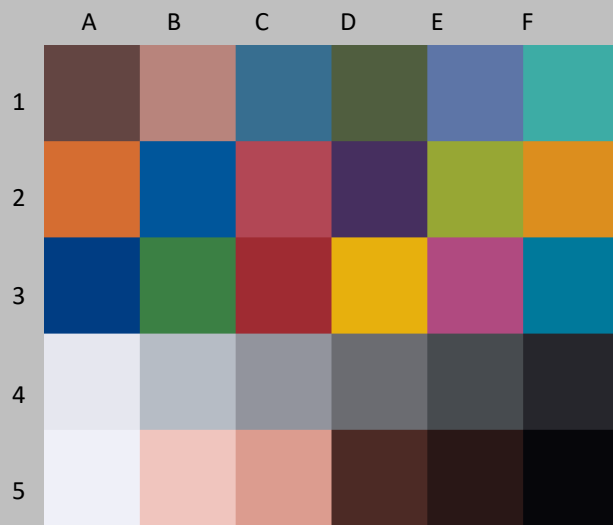


Original Print Colors before light exposure

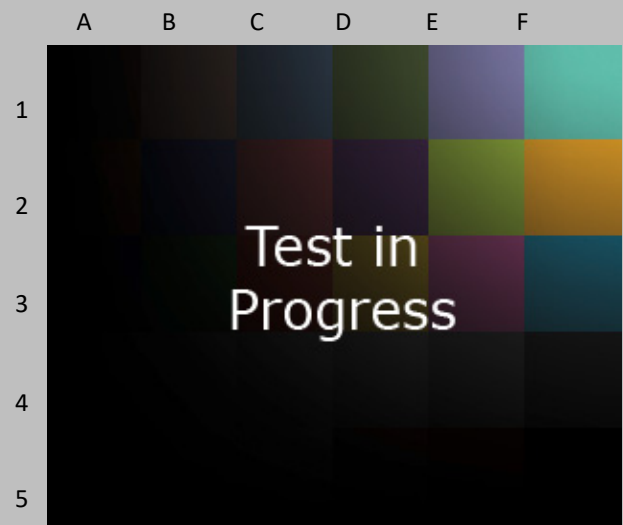


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	89.1	2.9	32.6	34.6	12.0	12.3	7.8	9.9
B1	Light Skin	86.7	4.1	60.2	62.6	17.2	16.3	12.5	15.7
C1	Blue sky	84.4	4.8	44.4	46.2	-8.3	-8.7	-24.2	-19.7
D1	Foliage	95.9	2.1	38.0	39.7	-12.0	-11.6	16.2	17.5
E1	blue flower	76.8	7.5	49.6	51.7	4.0	3.3	-28.6	-21.4
F1	bluish green	92.0	3.2	64.4	65.1	-32.7	-32.9	-5.8	-2.7
A1	orange	97.9	2.1	57.1	58.2	35.9	34.2	50.6	50.1
B2	purplish blue	87.1	6.6	34.8	36.3	-0.1	-3.9	-46.3	-41.0
C2	moderate red	97.5	2.0	45.0	46.2	44.2	43.7	14.6	16.2
D2	purple	91.1	3.7	24.3	25.9	21.2	20.5	-24.5	-21.2
E2	yellow green	99.2	1.3	65.5	66.3	-22.4	-21.8	55.2	54.5
F2	orange yellow	97.4	2.6	65.2	66.6	20.8	18.8	65.0	64.0
A3	blue	88.8	6.1	23.9	25.0	1.8	-2.7	-48.7	-44.8
B3	green	99.0	1.1	48.1	48.8	-35.5	-34.6	26.3	26.2
C3	red	98.4	1.6	36.7	37.6	46.8	47.4	24.3	25.4
D3	yellow	97.7	2.7	74.5	76.0	7.3	5.4	76.5	75.1
E3	magenta	91.0	5.0	46.3	47.7	46.8	45.7	-10.3	-5.6
F3	cyan	87.3	5.5	46.0	47.5	-24.4	-25.3	-28.4	-23.2
A4	white	8.3	9.2	91.5	90.9	0.3	-0.6	-3.9	5.2
B4	neutral 8	49.1	5.4	75.8	75.0	-1.0	-2.0	-4.7	0.6
C4	neutral 6.5	38.9	6.9	61.7	64.5	-0.4	-1.6	-5.3	0.8
D4	neutral 5	75.2	3.4	45.9	47.7	-0.3	0.1	-2.4	0.5
E4	neutral 3.5	84.2	2.8	31.8	33.7	-0.6	-0.6	-3.2	-1.2
F4	black	91.9	1.8	15.8	17.1	0.5	0.8	-3.4	-2.1
A5	paper white	13.8	8.7	94.8	93.9	0.1	-0.7	-4.3	4.4
B5	Skin highlight L*=88	76.3	4.2	82.7	83.1	12.7	11.2	8.9	12.8
C5	Skin highlight L* =75	92.6	2.8	70.1	71.4	20.7	18.3	15.5	16.2
D5	Skin shadow L*=28	90.3	2.7	21.5	22.9	14.4	15.4	10.7	12.7
E5	Skin shadow L*=13	84.6	2.3	10.3	11.3	8.4	9.6	5.3	7.0
F5	Maximum Black	100.0	1.6	2.3	3.9	-0.2	-0.2	-0.9	-1.4
Summary Results		I* Color	I* tone	ΔE	100 Mluxhrs + 1 year				
Average Score for all patches		82.1	93.3	3.9					
Worst 10% (3 lowest scoring patches)		20.3	86.6	8.5					



Original Print Colors before light exposure

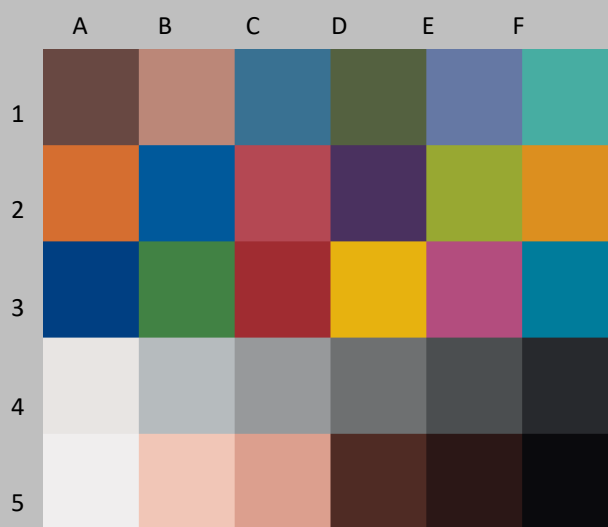


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin			32.4		12.2		6.8	
B1	Light Skin			60.2		17.6		12.0	
C1	Blue sky			44.4		-8.3		-24.2	
D1	Foliage			38.1		-11.8		15.7	
E1	blue flower			49.5		4.1		-28.9	
F1	bluish green			64.4		-32.7		-6.0	
A1	orange			57.3		35.9		50.2	
B2	purplish blue			34.8		0.2		-46.3	
C2	moderate red			45.2		44.3		14.4	
D2	purple			24.5		21.4		-24.7	
E2	yellow green			65.5		-22.4		55.0	
F2	orange yellow			65.6		20.9		64.6	
A3	blue			24.0		1.9		-48.6	
B3	green			48.0		-35.9		26.3	
C3	red			36.9		47.0		23.9	
D3	yellow			75.1		7.1		75.9	
E3	magenta			46.5		47.0		-10.4	
F3	cyan			46.0		-24.4		-28.4	
A4	white			91.7		0.5		-3.9	
B4	neutral 8			75.9		-0.8		-4.9	
C4	neutral 6.5			61.6		-0.2		-5.4	
D4	neutral 5			45.8		-0.3		-2.7	
E4	neutral 3.5			31.7		-0.7		-3.4	
F4	black			15.8		0.6		-3.6	
A5	paper white			94.8		0.1		-4.2	
B5	Skin highlight L*=88			83.3		12.7		8.9	
C5	Skin highlight L* =75			70.1		20.8		15.9	
D5	Skin shadow L*=28			21.5		14.3		10.4	
E5	Skin shadow L*=13			10.4		8.2		5.1	
F5	Maximum Black			2.4		-0.2		-0.7	
Summary Results		I* Color	I* tone	ΔE	200 Mluxhrs + 1 year				
Average Score for all patches									
Worst 10% (3 lowest scoring patches)									

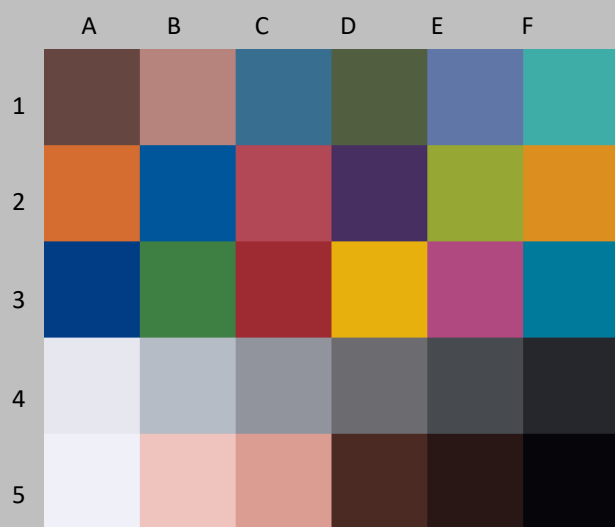


Original Print Colors before light exposure



Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	91.8	2.0	32.9	33.9	12.2	12.2	7.8	9.4
B1	Light Skin	87.9	3.2	60.2	61.1	17.2	16.7	12.5	15.5
C1	Blue sky	95.6	1.9	44.6	45.6	-8.2	-9.0	-24.1	-22.7
D1	Foliage	96.3	1.7	38.3	39.4	-11.8	-12.0	16.1	17.3
E1	blue flower	91.7	3.1	49.7	50.5	4.3	3.6	-28.8	-26.0
F1	bluish green	93.3	2.7	64.6	65.0	-32.4	-33.0	-6.1	-3.5
A1	orange	98.6	1.4	57.3	57.7	35.8	34.8	50.1	51.0
B2	purplish blue	93.0	3.8	35.0	35.9	0.1	-2.6	-46.5	-43.8
C2	moderate red	96.4	2.2	45.1	45.6	44.2	43.8	14.1	16.2
D2	purple	95.7	2.0	24.6	25.3	21.4	20.9	-24.6	-22.8
E2	yellow green	99.6	0.8	65.9	66.0	-22.3	-21.9	54.9	55.6
F2	orange yellow	99.2	1.1	65.7	66.0	20.7	19.7	64.8	65.2
A3	blue	95.5	2.8	24.2	24.7	2.0	-0.2	-48.9	-47.3
B3	green	99.8	0.8	48.4	48.9	-35.4	-35.0	26.3	26.7
C3	red	98.6	1.3	37.0	37.4	46.8	46.9	24.1	25.3
D3	yellow	99.9	0.6	75.2	75.3	6.8	6.3	75.6	75.9
E3	magenta	94.1	3.4	46.8	47.4	47.1	46.0	-10.2	-7.0
F3	cyan	96.0	2.1	46.2	46.8	-24.4	-24.9	-28.5	-26.6
A4	white	46.9	5.6	91.8	91.1	0.4	-0.3	-4.1	1.4
B4	neutral 8	74.2	3.0	75.9	75.7	-1.0	-1.9	-4.9	-2.1
C4	neutral 6.5	57.6	4.7	61.8	63.0	-0.2	-0.6	-5.4	-0.8
D4	neutral 5	86.0	2.1	46.1	47.1	-0.1	-0.6	-2.5	-0.7
E4	neutral 3.5	90.4	1.8	32.0	33.1	-0.5	-0.8	-3.3	-1.9
F4	black	99.4	1.0	15.9	16.7	0.5	0.4	-3.6	-3.0
A5	paper white	59.5	4.4	94.8	94.2	0.1	-0.5	-4.5	-0.1
B5	Skin highlight L*=88	76.6	4.1	83.4	83.0	12.5	11.8	8.6	12.6
C5	Skin highlight L*=75	90.8	2.9	70.3	70.8	20.6	19.0	15.5	17.9
D5	Skin shadow L*=28	96.1	1.4	21.6	22.3	14.4	14.8	10.6	11.7
E5	Skin shadow L*=13	97.3	0.9	10.6	11.0	8.2	8.6	4.9	5.5
F5	Maximum Black	100.0	0.4	2.6	3.0	-0.2	-0.3	-1.0	-1.1
Summary Results		I* Color	I* tone	ΔE	20 Mluxhrs + 2 years				
Average Score for all patches		89.9	96.6	2.3					
Worst 10% (3 lowest scoring patches)		54.6	93.4	4.9					

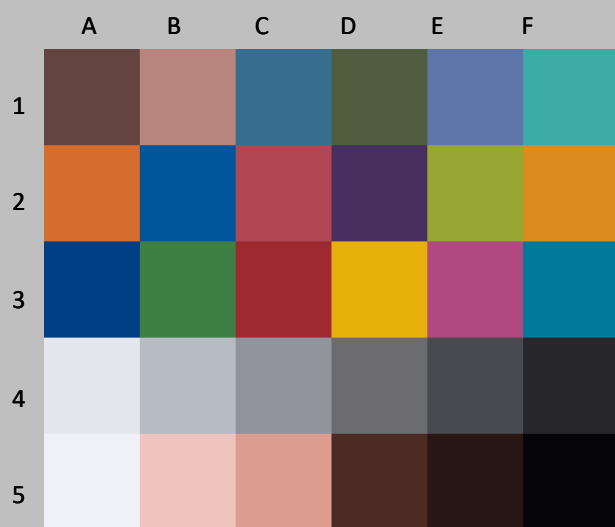


Original Print Colors before light exposure

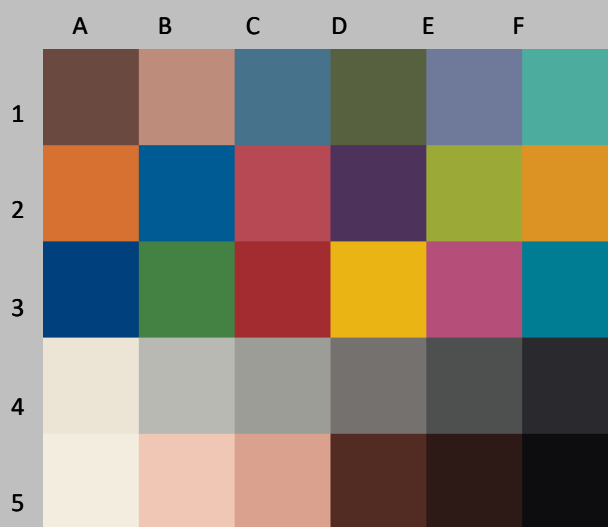


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	87.1	2.8	32.9	34.4	12.0	12.3	8.0	10.3
B1	Light Skin	80.8	4.9	60.1	61.9	17.2	16.4	12.4	16.9
C1	Blue sky	87.5	3.9	44.6	45.9	-8.2	-8.8	-24.0	-20.4
D1	Foliage	92.6	2.4	38.3	39.7	-11.9	-11.7	16.1	18.0
E1	blue flower	80.2	6.4	49.7	51.2	4.2	3.3	-28.6	-22.5
F1	bluish green	90.4	3.7	64.6	65.1	-32.6	-33.1	-5.9	-2.2
A1	orange	97.8	2.0	57.1	57.9	35.9	34.5	50.0	51.3
B2	purplish blue	87.6	6.4	35.0	36.2	0.1	-3.6	-46.2	-41.2
C2	moderate red	94.5	3.2	45.2	46.0	44.2	43.6	13.9	16.9
D2	purple	90.5	3.8	24.6	25.7	21.5	20.4	-24.5	-21.1
E2	yellow green	98.9	1.2	65.7	66.1	-22.4	-21.6	55.0	55.8
F2	orange yellow	98.3	1.8	65.4	66.2	20.8	19.5	64.6	65.6
A3	blue	89.5	5.7	24.1	24.9	2.0	-2.2	-48.8	-45.0
B3	green	98.5	1.3	48.4	48.9	-35.4	-34.5	26.4	27.2
C3	red	97.2	2.1	36.8	37.5	46.8	47.1	24.0	25.9
D3	yellow	99.2	1.3	74.7	75.4	7.1	6.3	76.2	76.9
E3	magenta	90.0	5.4	46.5	47.5	47.0	45.7	-10.4	-5.2
F3	cyan	89.4	4.6	46.1	47.1	-24.4	-25.2	-28.5	-24.1
A4	white	14.7	8.6	91.7	91.0	0.3	-0.6	-3.9	4.6
B4	neutral 8	51.3	5.2	75.9	75.4	-0.9	-2.0	-4.8	0.2
C4	neutral 6.5	35.4	7.1	61.7	64.0	-0.3	-1.3	-5.4	1.2
D4	neutral 5	74.3	3.3	46.0	47.4	-0.2	-0.2	-2.4	0.5
E4	neutral 3.5	80.4	2.9	31.9	33.5	-0.6	-0.7	-3.2	-0.9
F4	black	90.7	1.8	15.9	17.0	0.6	0.7	-3.6	-2.3
A5	paper white	23.4	7.8	94.8	94.1	0.1	-0.7	-4.3	3.4
B5	Skin highlight L*=88	66.6	5.7	82.8	82.9	12.7	11.5	8.8	14.3
C5	Skin highlight L* =75	87.9	3.8	70.1	71.0	20.7	18.7	15.5	18.4
D5	Skin shadow L*=28	91.9	2.3	21.4	22.7	14.5	15.1	10.7	12.6
E5	Skin shadow L*=13	92.3	1.7	10.3	11.4	8.4	9.0	5.2	6.3
F5	Maximum Black	100.0	0.7	2.4	3.0	-0.2	-0.2	-0.8	-1.2
Summary Results		I* Color	I* tone	ΔE	50 Mluxhrs + 2 years				
Average Score for all patches		82.0	95.0	3.8					
Worst 10% (3 lowest scoring patches)		24.5	89.4	7.8					

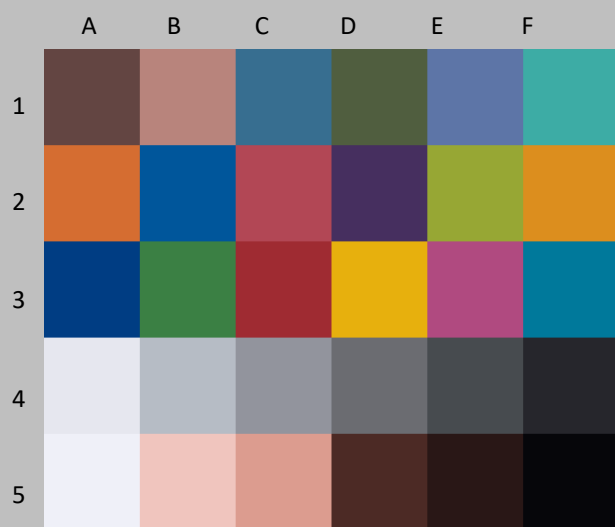


Original Print Colors before light exposure



Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	84.4	3.4	32.6	34.6	12.0	12.5	7.8	10.5
B1	Light Skin	79.2	5.5	60.2	62.7	17.2	16.4	12.5	17.4
C1	Blue sky	77.8	6.5	44.4	46.3	-8.3	-9.1	-24.2	-18.0
D1	Foliage	92.3	2.7	38.0	39.8	-12.0	-11.4	16.2	18.2
E1	blue flower	69.5	9.6	49.6	51.7	4.0	2.8	-28.6	-19.4
F1	bluish green	86.7	5.0	64.4	65.2	-32.7	-33.1	-5.8	-0.9
A1	orange	98.5	1.9	57.1	58.4	35.9	34.5	50.6	50.7
B2	purplish blue	82.5	8.7	34.8	36.3	-0.1	-4.9	-46.3	-39.1
C2	moderate red	94.8	3.2	45.0	46.4	44.2	43.9	14.6	17.5
D2	purple	87.2	4.9	24.3	26.0	21.2	20.2	-24.5	-20.0
E2	yellow green	99.1	1.3	65.5	66.4	-22.4	-21.4	55.2	55.1
F2	orange yellow	98.2	2.3	65.2	66.7	20.8	19.2	65.0	64.4
A3	blue	85.0	7.9	23.9	25.0	1.8	-3.7	-48.7	-43.2
B3	green	98.2	1.5	48.1	48.9	-35.5	-34.3	26.3	26.9
C3	red	97.2	2.2	36.7	37.7	46.8	47.5	24.3	26.1
D3	yellow	98.5	2.3	74.5	76.1	7.3	5.9	76.5	75.7
E3	magenta	87.1	6.9	46.3	47.8	46.8	45.6	-10.3	-3.7
F3	cyan	82.1	7.4	46.0	47.5	-24.4	-25.9	-28.4	-21.4
A4	white	(24.1)	12.3	91.5	91.0	0.3	-0.7	-3.9	8.3
B4	neutral 8	22.3	7.9	75.8	75.0	-1.0	-2.1	-4.7	3.1
C4	neutral 6.5	18.6	8.8	61.7	64.7	-0.4	-1.7	-5.3	2.8
D4	neutral 5	59.9	4.7	45.9	47.9	-0.3	0.0	-2.4	1.9
E4	neutral 3.5	73.8	3.6	31.8	33.8	-0.6	-0.6	-3.2	-0.2
F4	black	88.1	2.1	15.8	17.1	0.5	0.8	-3.4	-1.8
A5	paper white	(18.9)	11.8	94.8	93.9	0.1	-0.8	-4.3	7.5
B5	Skin highlight L*=88	60.8	6.6	82.7	83.2	12.7	11.3	8.9	15.4
C5	Skin highlight L* =75	88.9	3.7	70.1	71.5	20.7	18.4	15.5	18.1
D5	Skin shadow L*=28	88.6	2.9	21.5	22.9	14.4	15.5	10.7	13.0
E5	Skin shadow L*=13	86.5	2.3	10.3	11.6	8.4	9.4	5.3	6.9
F5	Maximum Black	100.0	1.5	2.3	3.8	-0.2	-0.3	-0.9	-1.3
Summary Results		I* Color	I* tone	ΔE	100 Mluxhrs + 2 years				
Average Score for all patches		74.8	93.2	5.0					
Worst 10% (3 lowest scoring patches)		(8.1)	86.3	11.2					



Original Print Colors before light exposure

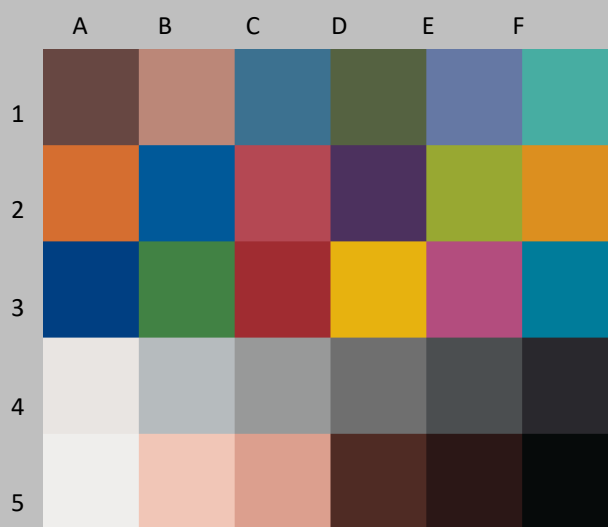


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin			32.4	34.9	12.2	12.4	6.8	8.4
B1	Light Skin			60.2	63.1	17.6	16.4	12.0	12.9
C1	Blue sky			44.4	46.8	-8.3	-7.7	-24.2	-23.2
D1	Foliage			38.1	40.2	-11.8	-11.8	15.7	16.3
E1	blue flower			49.5	52.3	4.1	4.5	-28.9	-25.8
F1	bluish green			64.4	65.9	-32.7	-32.5	-6.0	-6.4
A1	orange			57.3	58.6	35.9	34.0	50.2	49.1
B2	purplish blue			34.8	37.0	0.2	-1.8	-46.3	-44.7
C2	moderate red			45.2	46.6	44.3	44.0	14.4	14.0
D2	purple			24.5	26.2	21.4	21.4	-24.7	-23.7
E2	yellow green			65.5	66.9	-22.4	-22.7	55.0	53.8
F2	orange yellow			65.6	67.1	20.9	18.4	64.6	63.4
A3	blue			24.0	25.6	1.9	-0.4	-48.6	-47.8
B3	green			48.0	49.3	-35.9	-35.1	26.3	25.4
C3	red			36.9	37.8	47.0	47.5	23.9	24.2
D3	yellow			75.1	76.5	7.1	4.8	75.9	74.6
E3	magenta			46.5	48.1	47.0	46.5	-10.4	-9.3
F3	cyan			46.0	48.3	-24.4	-24.0	-28.4	-27.1
A4	white			91.7	92.2	0.5	0.4	-3.9	-2.3
B4	neutral 8			75.9	76.0	-0.8	-1.2	-4.9	-5.0
C4	neutral 6.5			61.6	65.3	-0.2	-1.1	-5.4	-3.3
D4	neutral 5			45.8	48.4	-0.3	0.3	-2.7	-2.1
E4	neutral 3.5			31.7	34.2	-0.7	-0.4	-3.4	-2.9
F4	black			15.8	17.5	0.6	1.0	-3.6	-3.1
A5	paper white			94.8	95.1	0.1	0.2	-4.2	-2.7
B5	Skin highlight L*=88			83.3	84.2	12.7	11.8	8.9	6.6
C5	Skin highlight L* =75			70.1	72.1	20.8	18.6	15.9	12.3
D5	Skin shadow L*=28			21.5	23.2	14.3	15.4	10.4	12.1
E5	Skin shadow L*=13			10.4	11.6	8.2	9.4	5.1	6.9
F5	Maximum Black			2.4	4.2	-0.2	-0.2	-0.7	-1.1
Summary Results		I* Color	I* tone	ΔE	200 Mluxhrs + 2 years				
Average Score for all patches									
Worst 10% (3 lowest scoring patches)									

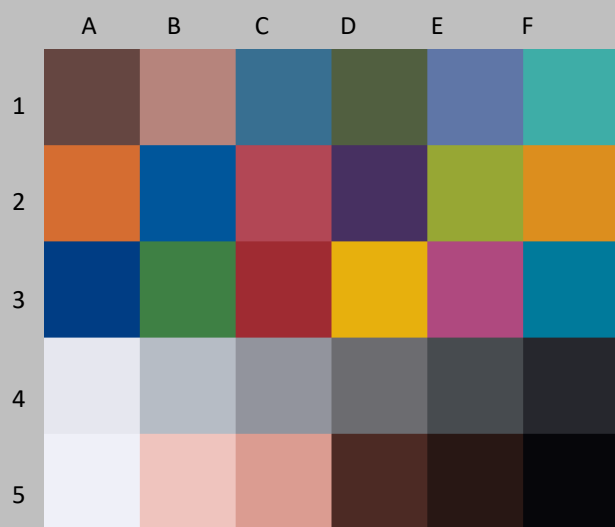


Original Print Colors before light exposure



Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	93.0	1.8	32.9	33.9	12.2	12.4	7.8	9.3
B1	Light Skin	86.5	3.5	60.2	61.1	17.2	16.7	12.5	15.9
C1	Blue sky	94.6	2.1	44.6	45.5	-8.2	-9.1	-24.1	-22.4
D1	Foliage	96.7	1.6	38.3	39.5	-11.8	-11.9	16.1	17.3
E1	blue flower	90.0	3.5	49.7	50.6	4.3	3.5	-28.8	-25.5
F1	bluish green	92.0	3.2	64.6	65.0	-32.4	-33.0	-6.1	-3.0
A1	orange	98.6	1.4	57.3	57.7	35.8	34.9	50.1	51.1
B2	purplish blue	92.0	4.3	35.0	35.9	0.1	-2.8	-46.5	-43.4
C2	moderate red	95.9	2.5	45.1	45.6	44.2	43.8	14.1	16.5
D2	purple	94.6	2.4	24.6	25.4	21.4	20.8	-24.6	-22.5
E2	yellow green	99.3	0.9	65.9	66.0	-22.3	-21.7	54.9	55.6
F2	orange yellow	99.3	1.0	65.7	65.9	20.7	19.9	64.8	65.3
A3	blue	94.8	3.1	24.2	24.7	2.0	-0.4	-48.9	-47.1
B3	green	99.5	0.9	48.4	48.9	-35.4	-35.0	26.3	26.8
C3	red	98.3	1.5	37.0	37.4	46.8	47.0	24.1	25.5
D3	yellow	99.9	0.6	75.2	75.3	6.8	6.4	75.6	76.0
E3	magenta	93.3	3.8	46.8	47.4	47.1	46.0	-10.2	-6.6
F3	cyan	95.0	2.4	46.2	46.8	-24.4	-25.0	-28.5	-26.2
A4	white	36.4	6.6	91.8	91.1	0.4	-0.4	-4.1	2.4
B4	neutral 8	68.6	3.5	75.9	75.7	-1.0	-1.9	-4.9	-1.5
C4	neutral 6.5	52.2	5.2	61.8	63.1	-0.2	-0.7	-5.4	-0.3
D4	neutral 5	83.1	2.3	46.1	47.1	-0.1	-0.6	-2.5	-0.4
E4	neutral 3.5	88.5	2.0	32.0	33.1	-0.5	-0.8	-3.3	-1.7
F4	black	97.7	1.1	15.9	16.7	0.5	0.5	-3.6	-2.9
A5	paper white	52.1	5.1	94.8	94.1	0.1	-0.5	-4.5	0.6
B5	Skin highlight L*=88	72.0	4.8	83.4	83.0	12.5	11.8	8.6	13.3
C5	Skin highlight L*=75	89.3	3.3	70.3	70.8	20.6	19.0	15.5	18.3
D5	Skin shadow L*=28	95.3	1.5	21.6	22.3	14.4	14.8	10.6	11.8
E5	Skin shadow L*=13	96.8	1.0	10.6	11.1	8.2	8.6	4.9	5.6
F5	Maximum Black	100.0	0.4	2.6	2.9	-0.2	-0.2	-1.0	-1.1
Summary Results		I* Color	I* tone	ΔE	20 Mluxhrs + 3 years				
Average Score for all patches		88.2	96.5	2.6					
Worst 10% (3 lowest scoring patches)		46.9	93.3	5.6					

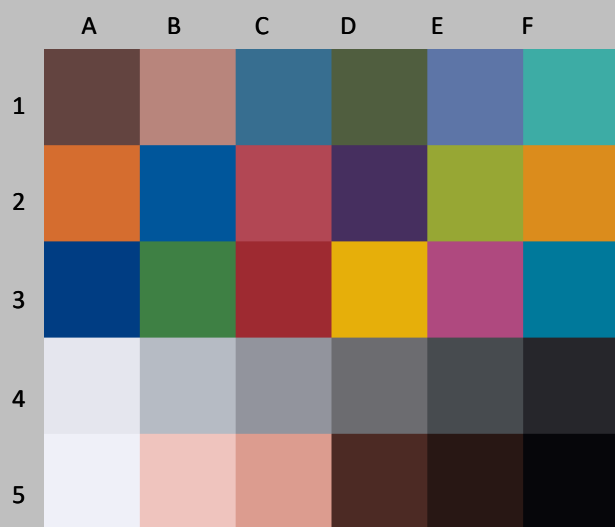


Original Print Colors before light exposure

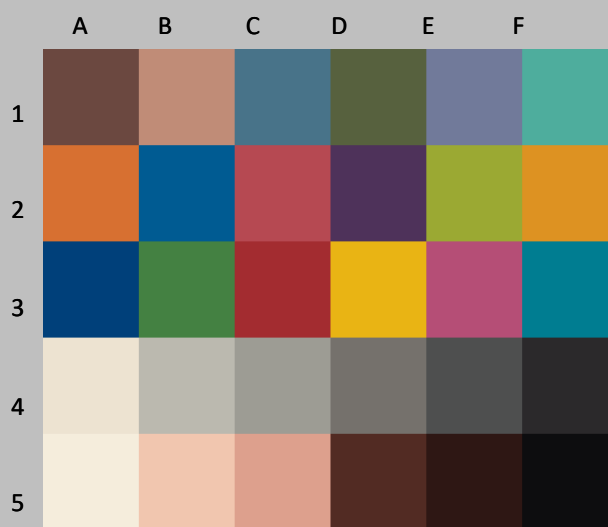


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	84.2	3.2	32.9	34.3	12.0	12.3	8.0	10.7
B1	Light Skin	75.6	5.9	60.1	61.8	17.2	16.5	12.4	18.0
C1	Blue sky	82.7	5.1	44.6	45.8	-8.2	-9.1	-24.0	-19.2
D1	Foliage	90.4	2.8	38.3	39.7	-11.9	-11.5	16.1	18.4
E1	blue flower	75.6	7.7	49.7	51.0	4.2	3.0	-28.6	-21.2
F1	bluish green	86.7	4.9	64.6	65.0	-32.6	-33.1	-5.9	-1.0
A1	orange	97.6	2.1	57.1	57.8	35.9	34.7	50.0	51.6
B2	purplish blue	84.7	7.6	35.0	36.1	0.1	-4.3	-46.2	-40.1
C2	moderate red	93.0	3.8	45.2	46.0	44.2	43.5	13.9	17.6
D2	purple	88.0	4.5	24.6	25.7	21.5	20.2	-24.5	-20.3
E2	yellow green	98.1	1.6	65.7	65.9	-22.4	-21.3	55.0	56.2
F2	orange yellow	98.3	1.8	65.4	66.1	20.8	19.8	64.6	65.9
A3	blue	86.8	7.0	24.1	24.8	2.0	-3.0	-48.8	-44.0
B3	green	97.2	1.8	48.4	48.8	-35.4	-34.3	26.4	27.8
C3	red	96.3	2.5	36.8	37.4	46.8	47.1	24.0	26.4
D3	yellow	99.2	1.3	74.7	75.3	7.1	6.7	76.2	77.2
E3	magenta	87.6	6.5	46.5	47.4	47.0	45.5	-10.4	-4.1
F3	cyan	85.9	5.8	46.1	47.0	-24.4	-25.6	-28.5	-22.8
A4	white	(6.3)	10.6	91.7	90.7	0.3	-0.6	-3.9	6.6
B4	neutral 8	34.6	6.8	75.9	75.1	-0.9	-2.1	-4.8	1.8
C4	neutral 6.5	22.4	8.2	61.7	63.9	-0.3	-1.3	-5.4	2.5
D4	neutral 5	65.0	4.0	46.0	47.3	-0.2	-0.2	-2.4	1.4
E4	neutral 3.5	73.8	3.4	31.9	33.5	-0.6	-0.8	-3.2	-0.3
F4	black	85.9	2.1	15.9	17.0	0.6	0.6	-3.6	-1.8
A5	paper white	4.6	9.6	94.8	93.9	0.1	-0.7	-4.3	5.2
B5	Skin highlight L*=88	56.5	7.2	82.8	82.7	12.7	11.6	8.8	15.9
C5	Skin highlight L* =75	84.2	4.6	70.1	70.9	20.7	18.8	15.5	19.6
D5	Skin shadow L*=28	91.5	2.3	21.4	22.6	14.5	15.1	10.7	12.6
E5	Skin shadow L*=13	93.1	1.7	10.3	11.5	8.4	8.9	5.2	6.2
F5	Maximum Black	100.0	0.8	2.4	3.1	-0.2	-0.2	-0.8	-1.2
Summary Results		I* Color	I* tone	ΔE	50 Mluxhrs + 3 years				
Average Score for all patches		77.1	94.9	4.6					
Worst 10% (3 lowest scoring patches)		6.9	89.3	9.5					

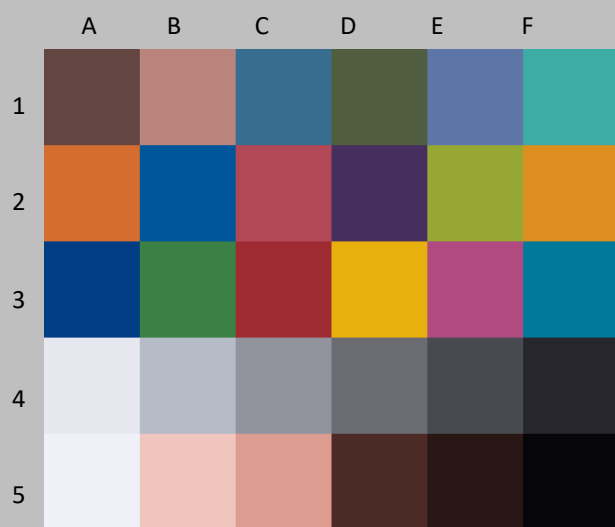


Original Print Colors before light exposure

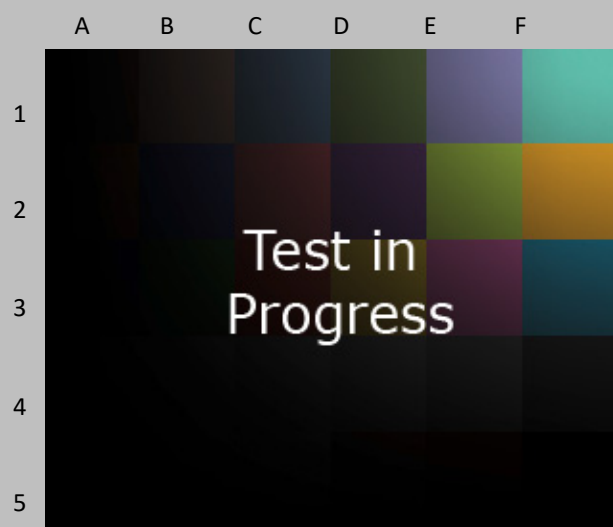


Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	80.7	3.8	32.6	34.5	12.0	12.7	7.8	11.0
B1	Light Skin	73.4	6.6	60.2	62.6	17.2	16.5	12.5	18.6
C1	Blue sky	73.2	7.5	44.4	46.2	-8.3	-9.2	-24.2	-16.9
D1	Foliage	90.1	3.0	38.0	39.7	-12.0	-11.2	16.2	18.6
E1	blue flower	64.4	11.0	49.6	51.6	4.0	2.6	-28.6	-17.9
F1	bluish green	83.2	6.1	64.4	65.0	-32.7	-33.1	-5.8	0.2
A1	orange	98.6	1.8	57.1	58.3	35.9	34.6	50.6	51.2
B2	purplish blue	79.5	10.1	34.8	36.1	-0.1	-5.5	-46.3	-37.9
C2	moderate red	93.0	4.0	45.0	46.4	44.2	43.9	14.6	18.3
D2	purple	85.0	5.6	24.3	25.9	21.2	20.1	-24.5	-19.3
E2	yellow green	98.5	1.6	65.5	66.3	-22.4	-21.1	55.2	55.5
F2	orange yellow	98.7	2.0	65.2	66.7	20.8	19.5	65.0	64.9
A3	blue	82.6	9.0	23.9	24.8	1.8	-4.4	-48.7	-42.3
B3	green	96.9	2.0	48.1	48.8	-35.5	-34.1	26.3	27.5
C3	red	96.4	2.6	36.7	37.7	46.8	47.6	24.3	26.5
D3	yellow	98.9	2.0	74.5	76.0	7.3	6.1	76.5	75.8
E3	magenta	84.4	8.1	46.3	47.8	46.8	45.4	-10.3	-2.4
F3	cyan	78.6	8.6	46.0	47.3	-24.4	-26.3	-28.4	-20.1
A4	white	(43.5)	14.2	91.5	90.7	0.3	-0.7	-3.9	10.2
B4	neutral 8	5.6	9.5	75.8	74.8	-1.0	-2.1	-4.7	4.7
C4	neutral 6.5	6.0	9.9	61.7	64.5	-0.4	-1.7	-5.3	4.0
D4	neutral 5	49.9	5.6	45.9	47.8	-0.3	0.1	-2.4	2.9
E4	neutral 3.5	68.3	4.1	31.8	33.8	-0.6	-0.5	-3.2	0.3
F4	black	84.1	2.4	15.8	17.1	0.5	0.9	-3.4	-1.4
A5	paper white	(38.0)	13.7	94.8	93.6	0.1	-0.8	-4.3	9.3
B5	Skin highlight L*=88	51.8	8.0	82.7	83.0	12.7	11.3	8.9	16.8
C5	Skin highlight L* =75	84.9	4.6	70.1	71.4	20.7	18.5	15.5	19.4
D5	Skin shadow L*=28	87.2	3.2	21.5	22.9	14.4	15.7	10.7	13.2
E5	Skin shadow L*=13	84.7	2.4	10.3	11.5	8.4	9.5	5.3	7.1
F5	Maximum Black	100.0	1.5	2.3	3.7	-0.2	-0.2	-0.9	-1.2
Summary Results		I* Color	I* tone	ΔE	100 Mluxhrs + 3 years				
Average Score for all patches		69.9	93.1	5.8					
Worst 10% (3 lowest scoring patches)		(25.3)	86.2	12.9					



Original Print Colors before light exposure



Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	91.8	3.0	32.4	34.9	12.2	12.4	6.8	8.4
B1	Light Skin	95.7	3.3	60.2	63.1	17.6	16.4	12.0	12.9
C1	Blue sky	97.5	2.7	44.4	46.8	-8.3	-7.7	-24.2	-23.2
D1	Foliage	99.7	2.1	38.1	40.2	-11.8	-11.8	15.7	16.3
E1	blue flower	91.1	4.2	49.5	52.3	4.1	4.5	-28.9	-25.8
F1	bluish green	100.0	1.6	64.4	65.9	-32.7	-32.5	-6.0	-6.4
A1	orange	97.2	2.6	57.3	58.6	35.9	34.0	50.2	49.1
B2	purplish blue	95.6	3.3	34.8	37.0	0.2	-1.8	-46.3	-44.7
C2	moderate red	100.0	1.5	45.2	46.6	44.3	44.0	14.4	14.0
D2	purple	98.5	2.0	24.5	26.2	21.4	21.4	-24.7	-23.7
E2	yellow green	98.8	1.9	65.5	66.9	-22.4	-22.7	55.0	53.8
F2	orange yellow	96.8	3.1	65.6	67.1	20.9	18.4	64.6	63.4
A3	blue	95.9	3.0	24.0	25.6	1.9	-0.4	-48.6	-47.8
B3	green	98.3	1.8	48.0	49.3	-35.9	-35.1	26.3	25.4
C3	red	99.9	1.1	36.9	37.8	47.0	47.5	23.9	24.2
D3	yellow	97.1	3.0	75.1	76.5	7.1	4.8	75.9	74.6
E3	magenta	98.6	2.0	46.5	48.1	47.0	46.5	-10.4	-9.3
F3	cyan	97.6	2.7	46.0	48.3	-24.4	-24.0	-28.4	-27.1
A4	white	89.1	1.6	91.7	92.2	0.5	0.4	-3.9	-2.3
B4	neutral 8	100.0	0.4	75.9	76.0	-0.8	-1.2	-4.9	-5.0
C4	neutral 6.5	81.0	4.3	61.6	65.3	-0.2	-1.1	-5.4	-3.3
D4	neutral 5	96.8	2.8	45.8	48.4	-0.3	0.3	-2.7	-2.1
E4	neutral 3.5	99.3	2.6	31.7	34.2	-0.7	-0.4	-3.4	-2.9
F4	black	97.8	1.8	15.8	17.5	0.6	1.0	-3.6	-3.1
A5	paper white	89.3	1.5	94.8	95.1	0.1	0.2	-4.2	-2.7
B5	Skin highlight L*=88	87.2	2.6	83.3	84.2	12.7	11.8	8.9	6.6
C5	Skin highlight L*=75	86.0	4.6	70.1	72.1	20.8	18.6	15.9	12.3
D5	Skin shadow L*=28	91.7	2.6	21.5	23.2	14.3	15.4	10.4	12.1
E5	Skin shadow L*=13	82.8	2.5	10.4	11.6	8.2	9.4	5.1	6.9
F5	Maximum Black	100.0	1.8	2.4	4.2	-0.2	-0.2	-0.7	-1.1
Summary Results		I* Color	I* tone	ΔE	200 Mluxhrs + 3 years				
Average Score for all patches									
Worst 10% (3 lowest scoring patches)									



Original Print Colors before light exposure



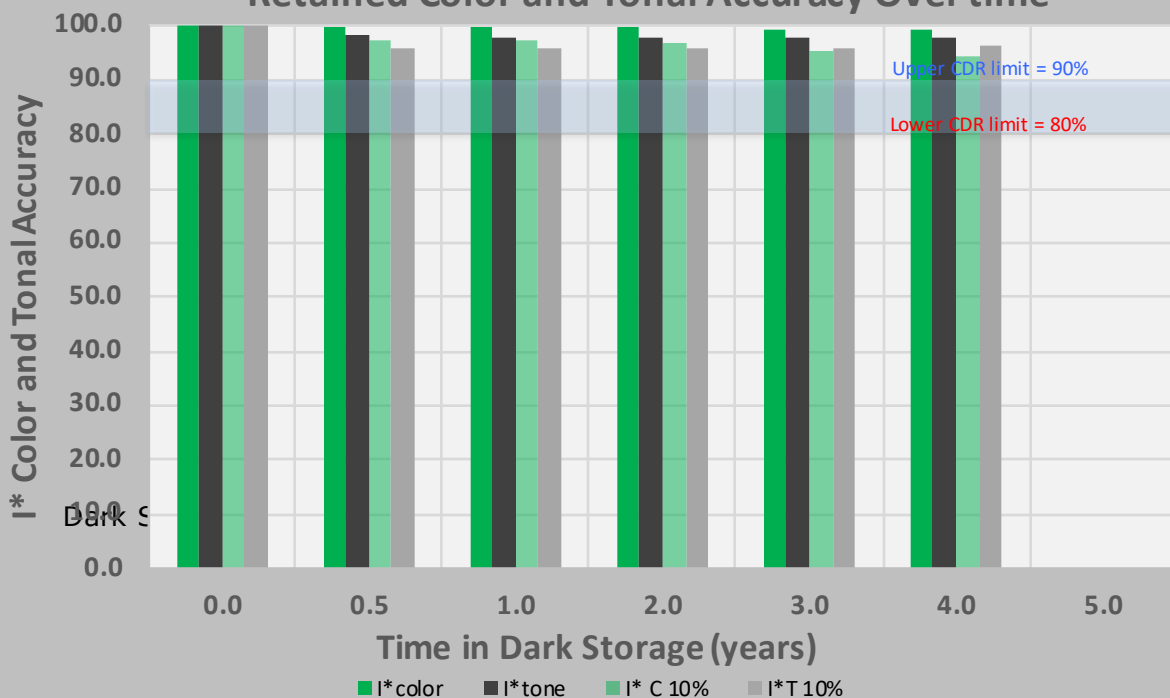
Colors after both light exposure + dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	90.1	2.2	32.9	34.0	12.2	12.3	7.8	9.7
B1	Light Skin	84.9	3.8	60.2	61.1	17.2	16.7	12.5	16.2
C1	Blue sky	93.4	2.4	44.6	45.5	-8.2	-9.1	-24.1	-22.1
D1	Foliage	95.7	1.8	38.3	39.5	-11.8	-11.8	16.1	17.5
E1	blue flower	88.6	3.9	49.7	50.5	4.3	3.4	-28.8	-25.1
F1	bluish green	91.2	3.4	64.6	65.0	-32.4	-33.0	-6.1	-2.8
A1	orange	98.4	1.6	57.3	57.7	35.8	34.8	50.1	51.3
B2	purplish blue	91.3	4.6	35.0	35.9	0.1	-3.0	-46.5	-43.1
C2	moderate red	95.3	2.7	45.1	45.6	44.2	43.8	14.1	16.7
D2	purple	93.8	2.6	24.6	25.4	21.4	20.7	-24.6	-22.2
E2	yellow green	98.9	1.1	65.9	66.0	-22.3	-21.7	54.9	55.9
F2	orange yellow	99.0	1.2	65.7	65.9	20.7	19.9	64.8	65.6
A3	blue	94.1	3.4	24.2	24.7	2.0	-0.7	-48.9	-46.8
B3	green	99.1	1.0	48.4	48.9	-35.4	-34.9	26.3	27.1
C3	red	97.9	1.7	37.0	37.4	46.8	47.0	24.1	25.7
D3	yellow	99.9	0.6	75.2	75.3	6.8	6.4	75.6	76.1
E3	magenta	92.4	4.2	46.8	47.4	47.1	45.9	-10.2	-6.2
F3	cyan	94.1	2.8	46.2	46.8	-24.4	-25.1	-28.5	-25.9
A4	white	29.7	7.2	91.8	91.0	0.4	-0.5	-4.1	3.1
B4	neutral 8	63.6	4.0	75.9	75.7	-1.0	-2.0	-4.9	-1.1
C4	neutral 6.5	47.9	5.6	61.8	63.1	-0.2	-0.7	-5.4	0.1
D4	neutral 5	80.3	2.6	46.1	47.1	-0.1	-0.6	-2.5	-0.2
E4	neutral 3.5	86.1	2.2	32.0	33.2	-0.5	-0.8	-3.3	-1.5
F4	black	95.0	1.3	15.9	16.7	0.5	0.4	-3.6	-2.6
A5	paper white	46.4	5.6	94.8	94.1	0.1	-0.6	-4.5	1.1
B5	Skin highlight L*=88	68.9	5.3	83.4	82.9	12.5	11.7	8.6	13.8
C5	Skin highlight L*=75	88.3	3.5	70.3	70.8	20.6	19.0	15.5	18.6
D5	Skin shadow L*=28	94.8	1.6	21.6	22.4	14.4	14.8	10.6	11.9
E5	Skin shadow L*=13	98.4	1.3	10.6	11.6	8.2	8.3	4.9	5.5
F5	Maximum Black	100.0	0.5	2.6	3.1	-0.2	-0.3	-1.0	-0.9
Summary Results		I* Color	I* tone	ΔE	20 Mluxhrs + 4 years				
Average Score for all patches		86.6	96.3	2.9					
Worst 10% (3 lowest scoring patches)		41.3	92.8	6.2					

Section IV: Ongoing Dark Storage Test Results

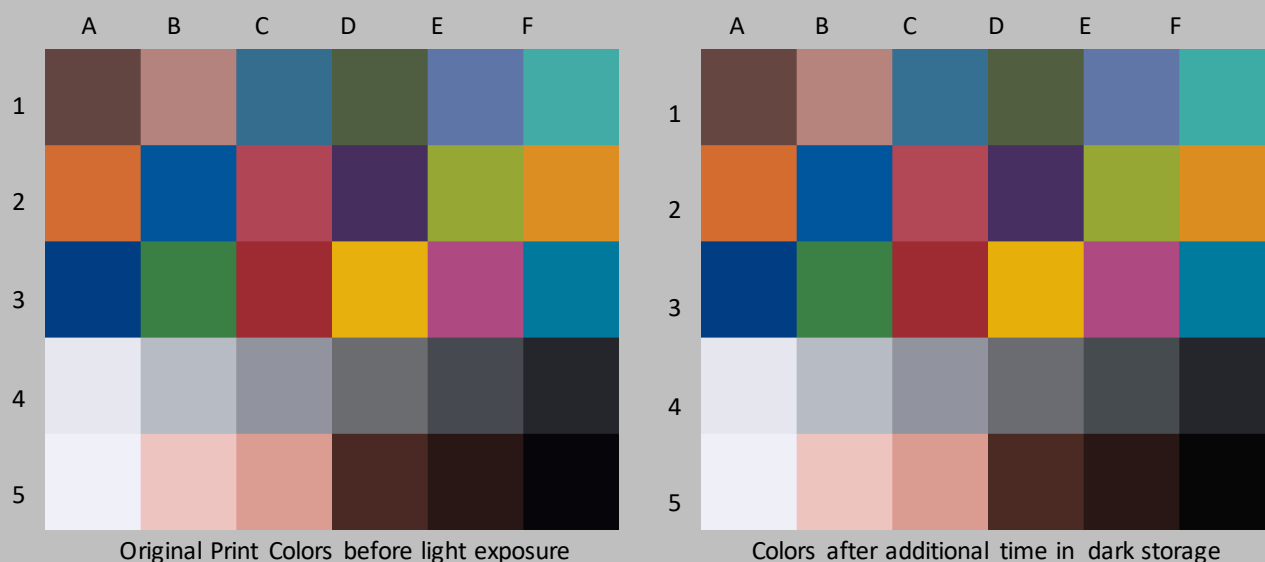
This section of the report tracks a sample of this print process (i.e., printer/ink/media) that remains in an ambient room temperature/moderate RH dark storage environment and has not been subjected to light exposure tests like the other samples. It is essentially a "control" sample that will remain in natural aging conditions (e.g., photo album storage) while the other light fastness tests are ongoing, and then in the Aardenburg Archives under similar conditions indefinitely along with the retired light fade samples. The chart below will be rescaled to longer time intervals once total accumulated storage time exceeds 5 years.

**Dark Storage Control Sample (i.e., no light exposure)
Retained Color and Tonal Accuracy Over time**

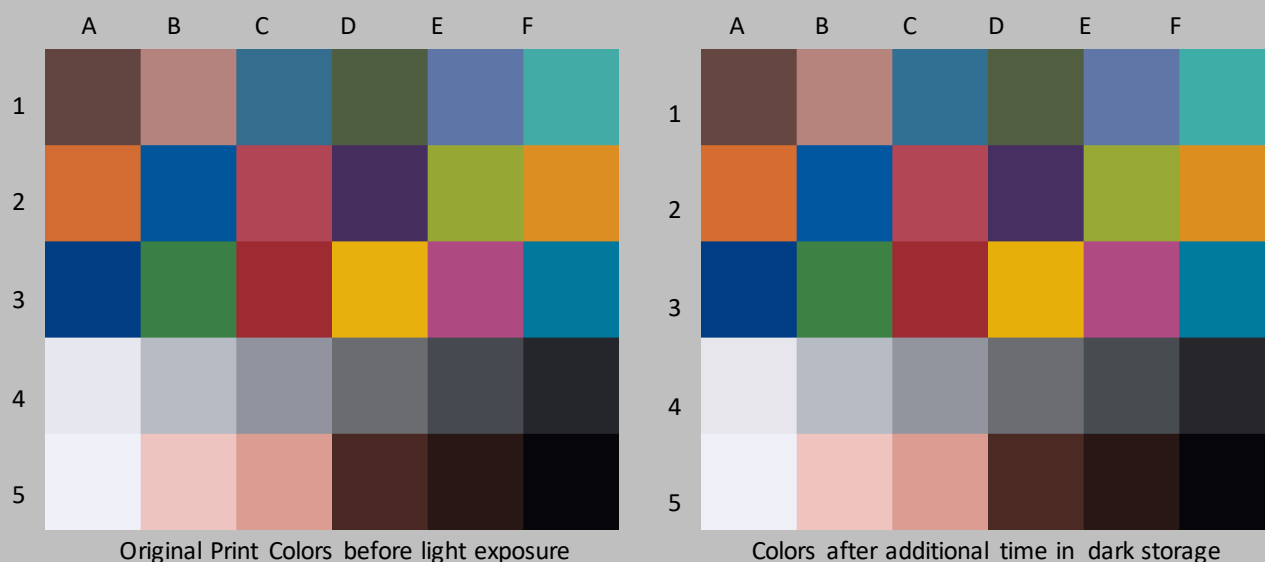


Time in Storage Summary for Dark Storage Control Sample

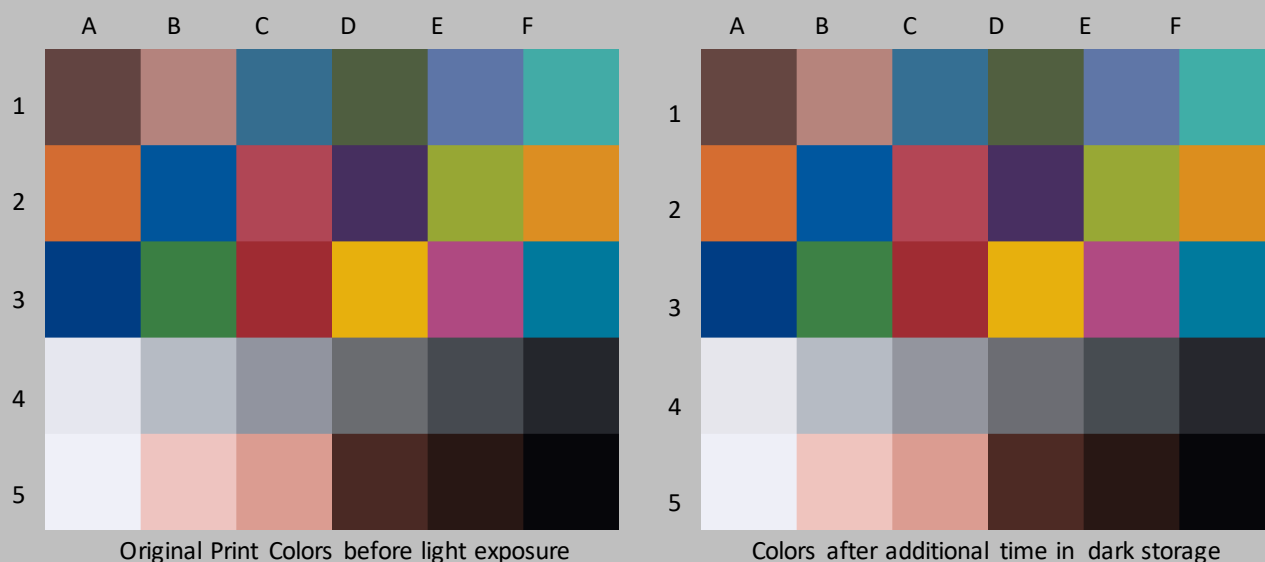
Years	I*color (worst 10%)	I* Tone (10%)	I* Color	I* tone	ΔE avg.	ΔE (worst 10%)
0.0	100.0	100.0	100.0	100.0	0.0	0.0
0.5	97.5	95.9	99.7	98.3	0.5	0.9
1.0	97.5	95.7	99.7	97.9	0.6	1.1
2.0	96.7	95.6	99.6	97.9	0.6	1.2
3.0	95.2	95.6	99.3	97.9	0.7	1.3
4.0	94.1	96.3	99.1	97.9	0.7	1.3
5.0						



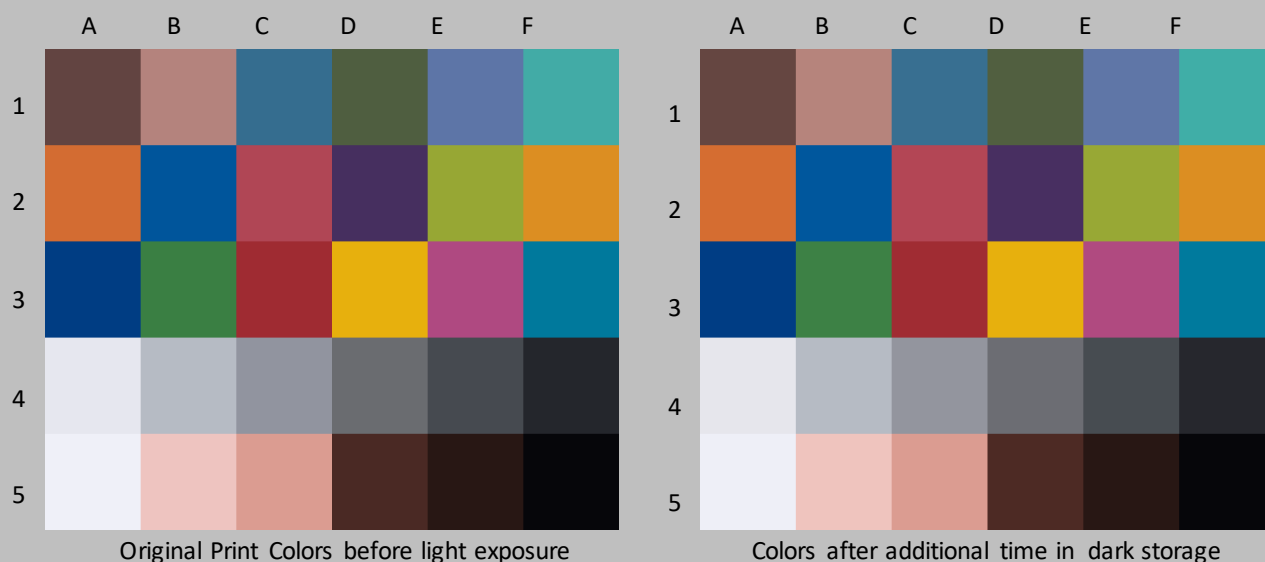
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.8	1.2	32.0	32.8	12.0	12.1	6.7	7.6
B1	Light Skin	99.4	0.6	59.8	59.9	17.4	17.1	11.3	11.8
C1	Blue sky	100.0	0.6	44.0	44.5	-8.2	-8.6	-24.3	-24.2
D1	Foliage	99.9	0.7	37.9	38.4	-11.8	-12.0	15.4	15.9
E1	blue flower	100.0	0.4	49.4	49.7	4.4	4.2	-29.0	-29.0
F1	bluish green	100.0	0.5	64.3	64.4	-32.5	-32.6	-6.4	-5.9
A1	orange	100.0	0.4	56.9	56.9	36.2	36.0	49.3	49.6
B2	purplish blue	100.0	0.6	34.5	34.8	0.5	0.1	-46.4	-46.6
C2	moderate red	100.0	0.3	44.9	45.0	44.5	44.5	13.7	13.9
D2	purple	100.0	0.2	24.4	24.6	21.5	21.5	-24.8	-25.0
E2	yellow green	100.0	0.1	65.6	65.6	-22.4	-22.3	55.0	55.1
F2	orange yellow	100.0	0.4	65.3	65.2	21.1	20.7	64.3	64.4
A3	blue	100.0	0.5	23.9	24.1	2.2	1.9	-48.7	-49.0
B3	green	100.0	0.5	48.0	48.3	-35.6	-35.6	25.7	26.1
C3	red	100.0	0.4	36.7	36.8	46.9	47.1	24.1	24.4
D3	yellow	100.0	0.3	74.8	74.5	7.1	6.8	75.7	75.8
E3	magenta	100.0	0.2	46.3	46.4	47.2	47.3	-10.8	-10.9
F3	cyan	100.0	0.5	45.9	46.2	-24.4	-24.8	-28.7	-28.7
A4	white	100.0	0.5	91.6	91.2	0.2	0.1	-3.9	-3.8
B4	neutral 8	100.0	0.2	75.8	75.7	-1.0	-1.1	-4.8	-4.8
C4	neutral 6.5	100.0	0.2	61.5	61.6	-0.2	-0.2	-5.7	-5.5
D4	neutral 5	100.0	0.5	45.6	46.0	-0.2	-0.4	-3.1	-2.9
E4	neutral 3.5	100.0	0.4	31.4	31.8	-0.7	-0.7	-3.8	-3.6
F4	black	100.0	0.5	15.6	15.8	0.5	0.3	-3.8	-3.4
A5	paper white	100.0	0.4	94.7	94.3	0.0	0.0	-4.4	-4.3
B5	Skin highlight L*=88	100.0	0.4	82.8	82.5	12.7	12.6	8.5	8.4
C5	Skin highlight L* =75	100.0	0.4	70.0	70.0	20.9	20.6	14.7	14.7
D5	Skin shadow L*=28	98.6	0.8	21.2	21.4	14.2	14.3	10.2	10.9
E5	Skin shadow L*=13	97.0	0.8	10.1	10.1	8.0	8.1	4.7	5.5
F5	Maximum Black	99.9	0.5	2.3	2.3	-0.2	-0.4	-0.9	-0.5
Summary Results		I* Color	I* tone	ΔE	DS Control at 6 months				
Average Score for all patches		99.7	98.3	0.5					
Worst 10% (3 lowest scoring patches)		97.5	95.9	0.9					



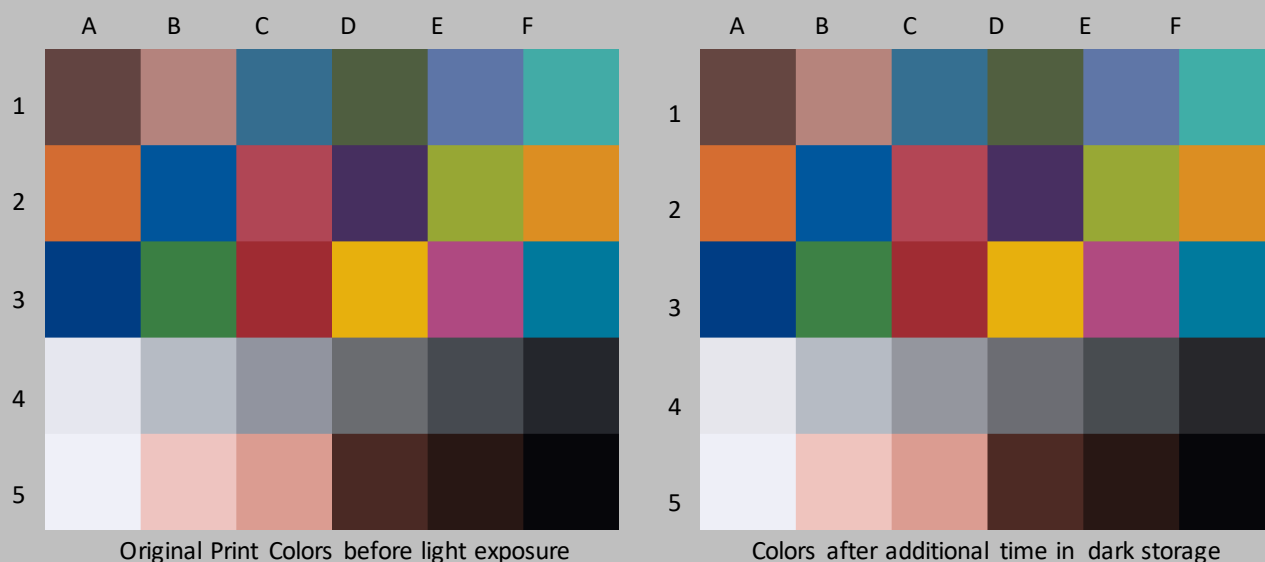
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.6	1.3	32.0	32.9	12.0	12.4	6.7	7.6
B1	Light Skin	100.0	0.6	59.8	60.2	17.4	17.4	11.3	11.8
C1	Blue sky	100.0	0.9	44.0	44.8	-8.2	-8.6	-24.3	-24.5
D1	Foliage	99.1	0.9	37.9	38.5	-11.8	-11.9	15.4	16.1
E1	blue flower	100.0	0.6	49.4	49.9	4.4	4.3	-29.0	-29.2
F1	bluish green	99.8	0.8	64.3	64.9	-32.5	-32.6	-6.4	-5.9
A1	orange	100.0	0.5	56.9	57.1	36.2	36.1	49.3	49.7
B2	purplish blue	100.0	0.8	34.5	35.1	0.5	0.0	-46.4	-46.6
C2	moderate red	100.0	0.4	44.9	45.2	44.5	44.7	13.7	13.9
D2	purple	100.0	0.4	24.4	24.8	21.5	21.7	-24.8	-25.0
E2	yellow green	100.0	0.2	65.6	65.8	-22.4	-22.3	55.0	55.1
F2	orange yellow	100.0	0.3	65.3	65.3	21.1	20.8	64.3	64.5
A3	blue	100.0	0.6	23.9	24.3	2.2	1.8	-48.7	-48.9
B3	green	100.0	0.7	48.0	48.6	-35.6	-35.7	25.7	26.2
C3	red	100.0	0.4	36.7	37.0	46.9	47.3	24.1	24.0
D3	yellow	100.0	0.2	74.8	74.7	7.1	7.0	75.7	75.8
E3	magenta	100.0	0.4	46.3	46.6	47.2	47.4	-10.8	-10.8
F3	cyan	100.0	0.6	45.9	46.3	-24.4	-24.7	-28.7	-28.8
A4	white	99.9	0.6	91.6	91.3	0.2	0.2	-3.9	-3.4
B4	neutral 8	100.0	0.3	75.8	75.8	-1.0	-1.2	-4.8	-5.0
C4	neutral 6.5	96.8	0.9	61.5	61.9	-0.2	0.0	-5.7	-4.9
D4	neutral 5	100.0	0.6	45.6	46.2	-0.2	-0.3	-3.1	-3.1
E4	neutral 3.5	100.0	0.6	31.4	32.0	-0.7	-0.7	-3.8	-3.7
F4	black	100.0	0.5	15.6	16.0	0.5	0.6	-3.8	-3.5
A5	paper white	100.0	0.4	94.7	94.5	0.0	-0.1	-4.4	-4.1
B5	Skin highlight L*=88	100.0	0.3	82.8	82.7	12.7	12.5	8.5	8.7
C5	Skin highlight L* =75	100.0	0.4	70.0	70.2	20.9	20.6	14.7	14.7
D5	Skin shadow L*=28	99.1	0.7	21.2	21.5	14.2	14.4	10.2	10.8
E5	Skin shadow L*=13	100.0	0.4	10.1	10.1	8.0	8.3	4.7	5.0
F5	Maximum Black	100.0	0.2	2.3	2.5	-0.2	-0.3	-0.9	-0.8
Summary Results		I* Color	I* tone	ΔE	DS Control at 1 year				
Average Score for all patches		99.7	97.9	0.6					
Worst 10% (3 lowest scoring patches)		97.5	95.7	1.1					



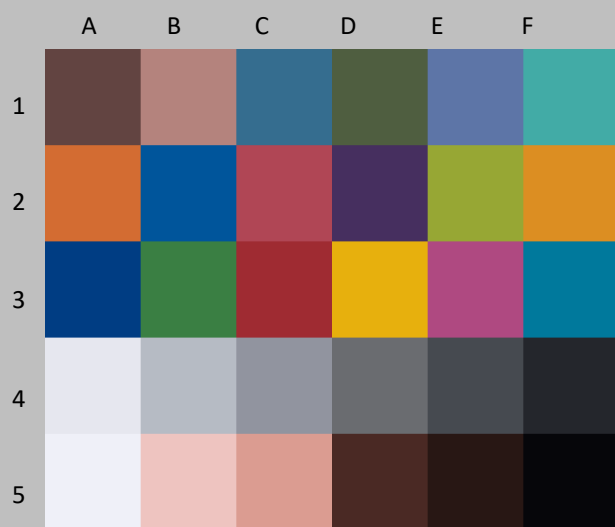
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.5	1.4	32.0	33.1	12.0	12.4	6.7	7.6
B1	Light Skin	99.9	0.6	59.8	60.1	17.4	17.4	11.3	11.8
C1	Blue sky	100.0	0.9	44.0	44.8	-8.2	-8.5	-24.3	-24.6
D1	Foliage	99.7	0.9	37.9	38.6	-11.8	-11.9	15.4	16.0
E1	blue flower	100.0	0.6	49.4	49.9	4.4	4.4	-29.0	-29.2
F1	bluish green	99.9	0.8	64.3	65.0	-32.5	-32.7	-6.4	-5.9
A1	orange	100.0	0.6	56.9	57.2	36.2	36.0	49.3	49.7
B2	purplish blue	100.0	0.7	34.5	35.1	0.5	0.1	-46.4	-46.6
C2	moderate red	100.0	0.6	44.9	45.3	44.5	44.6	13.7	14.1
D2	purple	100.0	0.5	24.4	24.8	21.5	21.8	-24.8	-24.9
E2	yellow green	100.0	0.3	65.6	65.8	-22.4	-22.3	55.0	55.0
F2	orange yellow	100.0	0.4	65.3	65.4	21.1	20.8	64.3	64.5
A3	blue	100.0	0.6	23.9	24.3	2.2	2.1	-48.7	-49.1
B3	green	100.0	0.6	48.0	48.6	-35.6	-35.6	25.7	26.0
C3	red	100.0	0.6	36.7	37.1	46.9	47.3	24.1	24.4
D3	yellow	100.0	0.1	74.8	74.8	7.1	7.0	75.7	75.8
E3	magenta	100.0	0.5	46.3	46.8	47.2	47.4	-10.8	-10.5
F3	cyan	100.0	0.6	45.9	46.4	-24.4	-24.6	-28.7	-29.0
A4	white	98.7	0.6	91.6	91.5	0.2	0.1	-3.9	-3.3
B4	neutral 8	100.0	0.3	75.8	75.9	-1.0	-1.2	-4.8	-5.0
C4	neutral 6.5	95.1	1.1	61.5	62.1	-0.2	0.0	-5.7	-4.8
D4	neutral 5	100.0	0.7	45.6	46.3	-0.2	-0.3	-3.1	-3.0
E4	neutral 3.5	100.0	0.7	31.4	32.1	-0.7	-0.6	-3.8	-3.6
F4	black	100.0	0.5	15.6	16.0	0.5	0.7	-3.8	-3.5
A5	paper white	100.0	0.5	94.7	94.6	0.0	-0.1	-4.4	-3.9
B5	Skin highlight L*=88	100.0	0.3	82.8	82.7	12.7	12.6	8.5	8.8
C5	Skin highlight L* =75	100.0	0.4	70.0	70.3	20.9	20.6	14.7	14.7
D5	Skin shadow L*=28	98.4	0.9	21.2	21.6	14.2	14.5	10.2	10.9
E5	Skin shadow L*=13	100.0	0.4	10.1	10.2	8.0	8.4	4.7	4.9
F5	Maximum Black	100.0	0.2	2.3	2.4	-0.2	-0.2	-0.9	-0.8
Summary Results		I* Color	I* tone	ΔE	DS Control at 2 years				
Average Score for all patches		99.6	97.9	0.6					
Worst 10% (3 lowest scoring patches)		96.7	95.6	1.2					



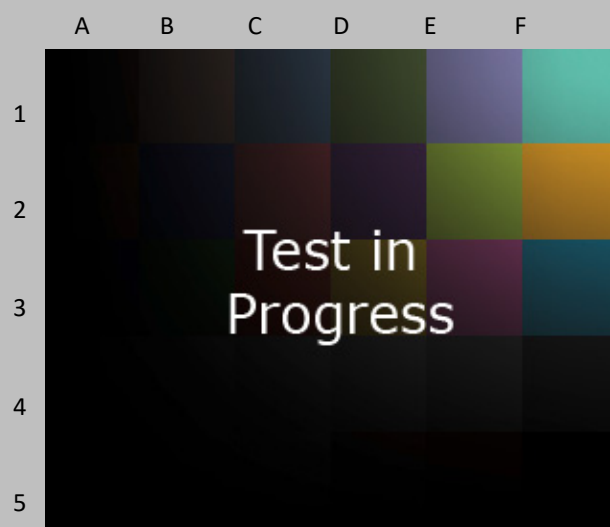
Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.1	1.5	32.0	33.0	12.0	12.4	6.7	7.6
B1	Light Skin	99.2	0.7	59.8	60.1	17.4	17.4	11.3	12.0
C1	Blue sky	100.0	0.9	44.0	44.8	-8.2	-8.5	-24.3	-24.5
D1	Foliage	99.5	0.9	37.9	38.6	-11.8	-11.8	15.4	16.0
E1	blue flower	100.0	0.5	49.4	49.9	4.4	4.4	-29.0	-29.2
F1	bluish green	99.4	0.9	64.3	65.0	-32.5	-32.7	-6.4	-5.7
A1	orange	99.9	0.6	56.9	57.2	36.2	36.0	49.3	49.8
B2	purplish blue	100.0	0.8	34.5	35.1	0.5	0.1	-46.4	-46.5
C2	moderate red	99.9	0.7	44.9	45.3	44.5	44.6	13.7	14.2
D2	purple	100.0	0.5	24.4	24.8	21.5	21.7	-24.8	-24.7
E2	yellow green	100.0	0.3	65.6	65.8	-22.4	-22.3	55.0	55.1
F2	orange yellow	100.0	0.5	65.3	65.5	21.1	20.7	64.3	64.1
A3	blue	100.0	0.5	23.9	24.3	2.2	2.0	-48.7	-48.9
B3	green	100.0	0.7	48.0	48.6	-35.6	-35.6	25.7	26.1
C3	red	99.9	0.7	36.7	37.1	46.9	47.3	24.1	24.4
D3	yellow	100.0	0.1	74.8	74.8	7.1	7.0	75.7	75.8
E3	magenta	100.0	0.6	46.3	46.8	47.2	47.4	-10.8	-10.4
F3	cyan	100.0	0.5	45.9	46.3	-24.4	-24.6	-28.7	-28.9
A4	white	96.7	0.9	91.6	91.4	0.2	0.1	-3.9	-3.1
B4	neutral 8	100.0	0.3	75.8	75.8	-1.0	-1.2	-4.8	-4.9
C4	neutral 6.5	92.8	1.3	61.5	62.1	-0.2	0.0	-5.7	-4.5
D4	neutral 5	100.0	0.8	45.6	46.3	-0.2	-0.3	-3.1	-2.9
E4	neutral 3.5	100.0	0.8	31.4	32.1	-0.7	-0.6	-3.8	-3.5
F4	black	100.0	0.6	15.6	16.1	0.5	0.7	-3.8	-3.6
A5	paper white	98.4	0.7	94.7	94.6	0.0	-0.1	-4.4	-3.8
B5	Skin highlight L*=88	99.6	0.6	82.8	82.7	12.7	12.6	8.5	9.0
C5	Skin highlight L* =75	100.0	0.5	70.0	70.3	20.9	20.6	14.7	14.9
D5	Skin shadow L*=28	97.7	1.0	21.2	21.6	14.2	14.5	10.2	11.0
E5	Skin shadow L*=13	98.4	0.7	10.1	10.2	8.0	8.3	4.7	5.3
F5	Maximum Black	100.0	0.2	2.3	2.4	-0.2	-0.2	-0.9	-0.8
Summary Results		I* Color	I* tone	ΔE	DS Control at 3 years				
Average Score for all patches		99.3	97.9	0.7					
Worst 10% (3 lowest scoring patches)		95.2	95.6	1.3					



Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin	96.6	1.3	32.0	32.9	12.0	12.5	6.7	7.5
B1	Light Skin	98.4	0.9	59.8	60.1	17.4	17.4	11.3	12.1
C1	Blue sky	100.0	0.8	44.0	44.8	-8.2	-8.5	-24.3	-24.4
D1	Foliage	98.9	1.0	37.9	38.6	-11.8	-11.9	15.4	16.2
E1	blue flower	100.0	0.5	49.4	49.8	4.4	4.4	-29.0	-29.1
F1	bluish green	98.8	1.1	64.3	65.0	-32.5	-32.8	-6.4	-5.5
A1	orange	99.9	0.6	56.9	57.2	36.2	36.1	49.3	49.8
B2	purplish blue	99.9	0.9	34.5	35.2	0.5	0.0	-46.4	-46.3
C2	moderate red	100.0	0.7	44.9	45.3	44.5	44.7	13.7	14.2
D2	purple	100.0	0.5	24.4	24.9	21.5	21.7	-24.8	-24.7
E2	yellow green	100.0	0.4	65.6	65.8	-22.4	-22.1	55.0	55.0
F2	orange yellow	100.0	0.4	65.3	65.5	21.1	20.8	64.3	64.2
A3	blue	100.0	0.6	23.9	24.3	2.2	1.8	-48.7	-48.8
B3	green	100.0	0.8	48.0	48.6	-35.6	-35.5	25.7	26.2
C3	red	99.8	0.7	36.7	37.1	46.9	47.3	24.1	24.5
D3	yellow	100.0	0.1	74.8	74.7	7.1	7.0	75.7	75.9
E3	magenta	100.0	0.6	46.3	46.8	47.2	47.4	-10.8	-10.3
F3	cyan	100.0	0.5	45.9	46.4	-24.4	-24.5	-28.7	-28.8
A4	white	95.3	1.0	91.6	91.4	0.2	0.1	-3.9	-3.0
B4	neutral 8	100.0	0.3	75.8	75.8	-1.0	-1.3	-4.8	-4.9
C4	neutral 6.5	90.7	1.5	61.5	62.2	-0.2	0.0	-5.7	-4.3
D4	neutral 5	100.0	0.8	45.6	46.4	-0.2	-0.4	-3.1	-2.9
E4	neutral 3.5	100.0	0.8	31.4	32.2	-0.7	-0.6	-3.8	-3.4
F4	black	100.0	0.6	15.6	16.1	0.5	0.7	-3.8	-3.5
A5	paper white	96.5	0.9	94.7	94.6	0.0	-0.1	-4.4	-3.6
B5	Skin highlight L*=88	99.2	0.6	82.8	82.7	12.7	12.6	8.5	9.1
C5	Skin highlight L* =75	100.0	0.6	70.0	70.3	20.9	20.5	14.7	14.9
D5	Skin shadow L*=28	97.7	1.0	21.2	21.6	14.2	14.5	10.2	11.0
E5	Skin shadow L*=13	100.0	0.5	10.1	10.3	8.0	8.3	4.7	5.1
F5	Maximum Black	100.0	0.3	2.3	2.5	-0.2	-0.3	-0.9	-0.9
Summary Results		I* Color	I* tone	ΔE	DS Control at 4 years				
Average Score for all patches		99.1	97.9	0.7					
Worst 10% (3 lowest scoring patches)		94.1	96.3	1.3					



Original Print Colors before light exposure



Colors after additional time in dark storage

Patch #	Description	I* Color	ΔE	L*		a*		b*	
				Before	After	Before	After	Before	After
A1	Dark Skin			32.0		12.0		6.7	
B1	Light Skin			59.8		17.4		11.3	
C1	Blue sky			44.0		-8.2		-24.3	
D1	Foliage			37.9		-11.8		15.4	
E1	blue flower			49.4		4.4		-29.0	
F1	bluish green			64.3		-32.5		-6.4	
A2	orange			56.9		36.2		49.3	
B2	purplish blue			34.5		0.5		-46.4	
C2	moderate red			44.9		44.5		13.7	
D2	purple			24.4		21.5		-24.8	
E2	yellow green			65.6		-22.4		55.0	
F2	orange yellow			65.3		21.1		64.3	
A3	blue			23.9		2.2		-48.7	
B3	green			48.0		-35.6		25.7	
C3	red			36.7		46.9		24.1	
D3	yellow			74.8		7.1		75.7	
E3	magenta			46.3		47.2		-10.8	
F3	cyan			45.9		-24.4		-28.7	
A4	white			91.6		0.2		-3.9	
B4	neutral 8			75.8		-1.0		-4.8	
C4	neutral 6.5			61.5		-0.2		-5.7	
D4	neutral 5			45.6		-0.2		-3.1	
E4	neutral 3.5			31.4		-0.7		-3.8	
F4	black			15.6		0.5		-3.8	
A5	paper white			94.7		0.0		-4.4	
B5	Skin highlight L*=88			82.8		12.7		8.5	
C5	Skin highlight L* =75			70.0		20.9		14.7	
D5	Skin shadow L*=28			21.2		14.2		10.2	
E5	Skin shadow L*=13			10.1		8.0		4.7	
F5	Maximum Black			2.3		-0.2		-0.9	
Summary Results		I* Color	I* tone	ΔE	DS Control at 5 years				
Average Score for all patches									
Worst 10% (3 lowest scoring patches)									

Section V: Comments and Conclusions

Initial Image Quality:

The initial image quality tone curve shown in section I is typical of an ICC profile used with relative colorimetric rendering and black point compensation (relcol/wBPC) even though perceptual rendering was chosen in Photoshop CC as the rendering intent for printing this sample set. Checking the Epson generic profile that was used, we later found that the relcol/wBPC and perceptual rendering intents print identically with the Epson-supplied profile. This can sometimes happen if the profiling software merely populates the perceptual rendering lookup tables (LUTs) with the same data as that used in the Relcol LUTs.

Another issue with initial image quality in this sample can be seen in the grayscale neutrality plots. Midtone grays shifted more bluish (b^* moved more negative) than should have occurred with a good ICC profile. Sometime after this sample was made, the LLK channel started to completely drop out on our SureColor P600. The shift towards bluish grays became severe. Cleaning cycles didn't help. Replacing the LLK cartridge resolved the issue. Therefore, it is possible that the samples used in this study may have been made during the early onset of the LLK cartridge problem. It could explain why the Epson-supplied profile didn't render the grayscale as well as it should have. This situation in turn might affect the overall fading results somewhat. However, we conclude that the data presented in this report is still meaningful, especially the results showing that media yellowing is a much greater issue than the fading of the inks in this printer/ink/media combination.

Print Longevity:

Epson Ultra Premium Photo Paper Luster is an archetypal example of a moderately fluorescing resin coated (RC) Inkjet photo paper containing both titanium dioxide (TiO₂) whitening pigments along with optical brightening agents (OBAs) incorporated into a polyethylene/TiO₂ layer which is extruded during manufacturing onto the paper base sheet. High OBA content is also present in the underlying paper base, but the TiO₂ pigments tend to strongly absorb the UV energy falling on the surface of the print as well as significantly hide any residual fluorescence that does manage to occur with the OBAs located in the paper base. Hence, Epson Premium Luster falls into Aardenburg's medium rather than high category for UV fluorescence. Unfortunately, TiO₂ and OBAs take part in a complex chemical reaction after exposure to light such that more media yellowing occurs under low illumination and dark storage conditions over time than can be accounted for only by the loss of OBA fluorescence. Aardenburg Imaging refers to this chemical reaction as **light-induced low intensity staining (LILIS)**. See section III of this report. The SC P600/HD ink/Premium Luster Photo combination would otherwise achieve an excellent light fastness rating of 126-173 Megalux hours were it not for the significant LILIS problem. When remeasurements of the light exposed samples are made after two years of dark storage the rating falls to 9-20 Mlux hrs, and after 3-4 years the score has reached 6.9-15 Mluxhrs. The reaction rate is slowing down over time, but it may continue to fall as longer dark storage periods are evaluated.

That the media yellowing is light induced rather than heat, humidity, and/or gas induced can be concluded by comparing section III results to the unexposed dark storage control sample being tracked in section IV of this study. Note also that the yellow stain formation can be significantly reversed by light-bleaching with additional exposure to high illumination levels which is why it doesn't form during the light exposure-only cycle (compare section II and III results). However, the staining will reappear over time as the print is once again placed in lower illumination or dark storage environments. Hence, media that mix both TiO₂ and OBAs in common coating layers are best avoided for use in archival printmaking. Regrettably, in today's market this situation means avoiding many popular RC photo and fine art printing media where TiO₂ and OBAs are incorporated in one or more of the coating layers.

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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.

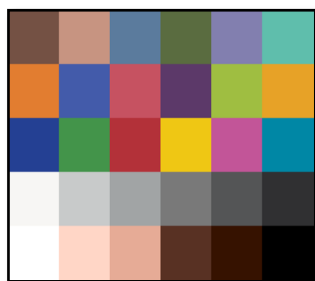
(1) Eastman Kodak cited this exposure condition with a 90% confidence limit as a rationale for estimating print fading times of traditional color photo materials in typical home display environments. However, for light fading claims regarding its line of pigment-based inkjet printers, Kodak adopted the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



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). Aal&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, Aal&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.



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 Munsell 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

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 Aal&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 I: The Conservation Display Rating Criteria Set	
Upper Exposure limit (calculated from the average score for all sampled colors)	Overall average I* Color score $\geq 90\%$ and overall average I* tone score $\geq 90\%$
Lower Exposure limit (calculated from the average score for the worst 10% of the sampled colors)	I* Color score for worst ten percent of sampled colors $\geq 80\%$ and I* tone score for worst ten percent of sampled colors $\geq 80\%$
Physical Properties Requirement	No cracking, crazing, flaking, delamination, or physical deformation of image receiver layer observed during the conservation display rated exposure range.
"Worst ten percent" refers to those 10% of the color samples from within the sampled image population that exhibit the greatest amount of change.	

The I* metric was conceived as a colorimetric algorithm to measure and track changes in image color and tonal accuracy with respect to an original reference image.^{1,2} It scores the retained color and tonal accuracy on a percentile scale from a state of perfect matching (i.e., 100%) to a state of no color and tonal accuracy (i.e., 0%). It also scores any state where false rendering of the reference image tone and color quality has occurred (i.e., negative I* values for color and tone which signify falsely substituted colors and/or tonal reversals). The I* metric is an excellent foundation upon which to build criteria for acceptable change in color and tonal accuracy.

For more information on the Aardenburg Conservation Display ratings, please see the article entitled: : "An Overview of the Aardenburg Imaging Conservation Display Ratings".

Other relevant articles are:

- 1) Mark McCormick-Goodhart, Henry Wilhelm, and Dmitriy Shklyarov, "A 'Retained Image Appearance' Metric For Full Tonal Scale, Colorimetric Evaluation of Photographic Image Stability," IS&T's NIP20: International Conference on Digital Printing Technologies, Final Program and Proceedings, IS&T, Springfield, VA, October 3–November 5, 2004, pp. 680–688.
- 2) Mark H. McCormick-Goodhart, "An Introduction to the I* Metric," Aardenburg Imaging & Archives, February 7, 2007

These papers and more are available in PDF format on the documents page of the Aardenburg website:

<https://www.aardenburg-imaging.com/documents/>