Aardenburg
144

IMAGING & ARCHIVES

Tested System:
ID#:284

Printer: Durst Theta 51

Inks/Colorants: Silver Halide Development Process (see notes)

Media: Ilford Galerie RC Digital Silver B&W paper – Sepia toned

Coating(s): no additional coating

Sample #: AaI_20111116_SN003

Testing Status: 100 Megalux hours total light exposure
Testing Is ongoing, next update on approximately JAN 05, 2015

Conservation Display Rating (CDR)

Lower limit: 9.7 Megalux hours (for weakest 10% of the color patches)
Upper limit: 16 Megalux hours (for average of all the color patches)

Note: a CDR with narrow range (typically less than 2:1) indicates relatively even overall fading of the image. A wide range indicates faster fading in certain local colors/tones prior to general fading of most colors/tones in the entire image. Compare ratings for different systems directly and/or use the table on page 2 to estimate time (years) on display.

* Please read document AaI_2009_0118_TA-01.pdf, **"An Overview of the AaI&A Conservation Display Ratings"**, located on the Documents page of the AaI&A website for furhter explanation of the Conservation display ratings.

http://www.aardenburg-imaging.com

Aardenburg Imaging
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About this Report

This report contains light fastness information about a sample test print produced by a specific digital printing system. "System" refers to all hardware, software, and materials used to make the finished print. The hardware, software, material components, and printmaker's skills contribute to the final image quality and image permanence. The tested sample is made with current or recently discontinued stocks of commercially available products unless otherwise stated. Each sample has been prepared by Aardenburg Imaging & Archives or one of its members in accordance with customary print making practices unless otherwise noted. The sample may also contain additional finishing materials such as overcoats and laminates which are also noted when used. Finally, the sample has been tested under standardized conditions that are defined on the Sample Description page (see page 4). AaI&A makes every effort to ensure but cannot guarantee that the samples are properly identified and documented and that test results are accurate. For this reason, AaI&A also strives to test independently produced sample replicates in order to increase sampling confidence and to provide information on process variability. Please compare the results in this report to replicate test samples when the data become available.

Understanding this Report

The magnitude and visual appearance of fading depends not only on the chosen printing system but the chosen image as well. In other words, different images are comprised of different colors, and the fading relationships between those colors dictate how the image will look as it fades. The sample print in this test report was made by reproducing the digital image shown on the left. It contains 30 standard colors. 24 of the colors are colorimetrically matched to the Macbeth ColorChecker™ chart viewed under D50 illumination. The remaining six colors supplement the ColorChecker™ array with four additional skin tone colors, one patch for paper white, and another for maximum black. The additional colors also round out the distribution of CIELAB L* (lightness) values in the test target.

Information about the fading characteristics of the product is provided in three ways:

1) You can visually assess the fading. The target images reproduced in this report are digitally reconstructed from the spectrally measured color data rather than scanning or otherwise reproducing the physical print by conventional techniques. This method ensures a colorimetrically accurate representation of the print appearance as the print fades. A calibrated monitor is recommended to experience the best possible reproduction of the test sample appearance. The side-by-side "before and after" presentation of the target images simulates looking at a perfect copy of the unexposed original print along side the same print after light exposure. You can also use Adobe Reader's full screen mode to cycle through the pages and "animate" the fading.

2) I* Color and tonal accuracy scores are reported. This report includes I* metric scores that compare the color and tonal relationships of the light exposed samples to the color and tonal relationships existing in the original print prior to light exposure. Perfect I* scores of 100% can be approached when no significant fading occurs. Average scores above 90% generally indicate excellent retention of original quality, 80% good, 70% fair, etc., but your conclusions may vary depending on your image quality requirements. I* color rates the retained color accuracy (hue and chroma) while I* tone rates the retained tonal accuracy (lightness and contrast). The score is on a percentile scale where 100% is a perfect match between the comparison image (e.g., "after" light exposure) and the reference image (e.g., "before" any light exposure). 0% I* color means no color accuracy is left. 0% I* tone means essentially no tonality remains and all image information content is lost. Negative I* values have significance as well and contribute to the average I* score when they occur. Negative I* color values mean false color has occurred, for example, when a skin tone turns green or a neutral gray becomes distinctly colorful. Negative I* tone scores mean visual contrast between colors has become inverted (i.e., like the tonal relationships in a photographic film negative). Serious image quality problems must arise before false colors and/or tones appear. For more information on the I* metric, please refer to the AaI&A web site.

3) Color changes are also reported using the classic color difference model, ΔE. Note that ΔE values lose perceptual scaling significance when they become large (e.g., > 15). Also, the ΔE equation does not unambiguously measure changes in image contrast. This limitation is generally not a problem for paints and textiles, but can be a serious oversight when evaluating photographic images. Properly tracking changes in image contrast was a major reason behind the development of the I* metric.

Table to Convert Megalux-hours of Light Exposure to estimated "Years on Display"												
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	**11.4**	**114**	**228**	**342**	**457**	**571**	**685**	**799**	**913**	**1027**	**1142**
50 Lux **12 hours per day**	"Museum Standard" display condition	**4.6**	**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).	**1.9**	**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.	**1.0**	**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.	**0.5**	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**41**	**46**	**51**

Light levels commonly encountered in the real world fluctuate widely throughout indoor print display environments and produce large variations in how long it takes for artwork to acquire light-induced damage. Use this table as a guide to estimate how many "years on display" (denoted in red text) it takes to accumulate the light exposure test dosage. Review the test results to decide which Megalux-hour dose has caused fading to your level of concern (e.g., just noticeable, easily noticeable, objectionable, etc.). Then choose the print display description that best represents how your print is likely to be displayed. You may want to obtain a lux meter and make some measurements in your own display environment!

Note that as the years of display time increase, light-induced fading can be eclipsed by other serious aging mechanisms such as fading and/or staining caused by heat, humidity, and air pollutants. Mould damage can also occur at high humidity. Even when colorants remain water fast, direct contact with liquids may result in physical deformation and staining of the substrate. Also, temperature and especially humidity cycling can cause physical cracks and/or flaking, etc. Handling damage such as scratching, abrasion, tears and creases, and catastrophic damage by smoke, fire, flood, etc., also degrade print quality over time. Thus, as illumination levels are reduced other forms of degradation take on greater proportion of risk and may appear in shorter time intervals.

(1) Eastman Kodak 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. For light fading claims regarding its newer 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 dose (at 75˚F/60%RH assumed temperature and humidity levels) used in conjunction with WIR's visually weighted densitometric endpoint criteria set V3.0 became a de facto industry standard during the first decade of the 21st century in the absence of a published International Standards Organization (ISO) test standard. However, the WIR V3.0 visual criteria set used to predict "easily noticeable fade" was designed for traditional 20th century silver–halide color photofinishing processes. It is not well suited to the evaluation of modern digital media. Nevertheless, the WIR assumed daily light exposure dose is one of many commonly encountered light exposure conditions existing within the range of real world picture display locations.

Sample Description

Sample #	**AaI_20111116_SN003**	**Batch #:**	L1
Printer:	Durst Theta 51		
Ink:	Silver Halide Development Process (see notes)		
Media:	Ilford Galerie RC Digital Silver B&W paper – Sepia toned		
Coating(s):	no additional coating		

Test Print Prepared by:	AaI&A (see notes)
Printed:	November 16, 2011
Initial Print colors measured	February 5, 2012
Test Started:	February 6, 2012

Test Image:	AaI_StandardB&Wset(v2).tif
RIP?Driver settings:	n.a.

Media Setting n.a.

Profile:	n.a.	**Rendering**	n.a.
Profile type:	n.a.		

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

Optical Brighteners Present? *yes (high)*	**L***		**a***		**b***	
Media Whitepoint Color	UV inc	UV exc	UV inc	UV exc	UV inc	UV exc
	96.2	95.9	1.2	-0.2	-3.5	1.7
	UV-inc/UV-exc ΔL*, Δa*, Δb* respectively					
	0.3		1.4		5.2	
	Calculated differences, especially for Δb, indicate the role and magnitude of fluorescence on original paper color*					
Maximum Printed Black	L*	a*	b*	Optical Density (Dmax)		
	6.7	3.5	2.4	2.13		

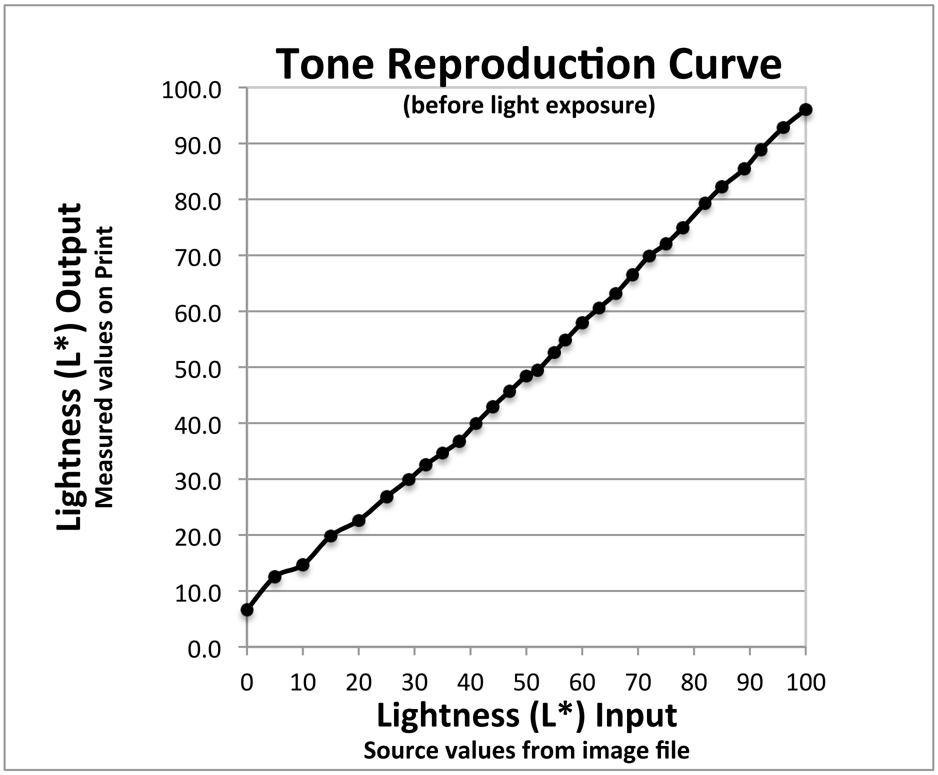
Light source:	Phillips Colortone F40T12/C50 – 5000˚K full spectrum fluorescent. Color rendering Index (CRI) =92), soda lime glass filtered
Light Exposure Cycle:	8 hours on, 4 hours off, twice per 24 hours
CIELAB measurements:	D50 2˚ observer, Xrite Gretag/Macbeth Spectrolino/Spectroscan

Average Illuminance during "on" cycle:	**10429 Lux**
Average Temperature:	23.8˚C over full test duration, 25.3˚C during light exposure.
Average Relative humidity:	55.7%RH over full test duration, 55.7%RH during light exposure.

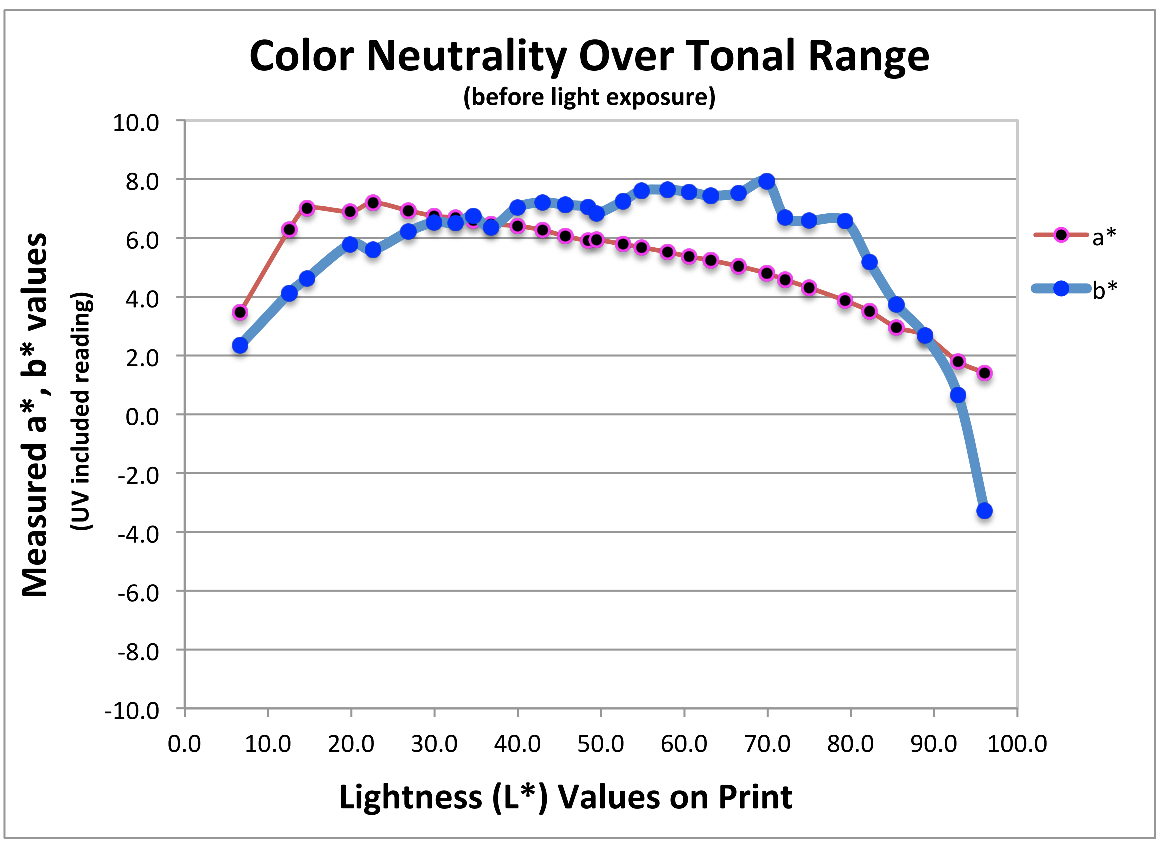
Replicates/Compare to:

Compare to sample #s **AaI_20111116_SN001** (no chemical toning) and **AaI_20111116_SN002** (toned by a traditional selenium toner diluted 1: 20 for silver gelatin process). These RC paper samples were all processed at the same time and on the same batch of paper.

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Midtone Gamma = 0.9194 L*min = 6.7 L*max = 96.1



** **AaI&A** sent the standard black&white test target (AaI_Blackandwhite_Print_Page(V2).tif) to a commercial photo lab (http://www.digitalsilverimaging.com) with instructions to print normally. This sample was also chemically toned with Sepia toner. It is therefore a conventionally processed and Sepia toned traditional B&W silver gelatin print made on resin coated (RC) paper.

See: http://ilfordphoto.com/products/product.asp?n=71&t=Photographic+Papers+Digital

MHMG note: 2013-04-21: Like many new RC papers today made for both modern inkjet printers and for the traditional photo finishing market today, this paper incorporates a high level of optical brighteners (OBAs). It is the OBA fading in this sample and subsequent impact on media whitepoint stability that accounts for these light fade test results. The silver image particles are undoubtedly not exhibiting any fade which is why the I* tone score that tracks lightness and contrast retention remains very high while the I* color score that tracks hue and chroma retention is significantly declining. I had anticipated that the gelatin layer which is a swellable polymer coating might impart some better fade resistance for the OBAs than what is typically found for high OBA content embedded in microporous ink receptor layers of modern ink jet papers as well, but the results don't bear out this hypothesis. The OBA burnout is rapid. Prints made on this paper should be regarded by collectors, curators, and photo conservators as being fragile with respect to light intensity levels while on display. Framing the print with a conservation glazing material like OP3 plexiglass or museum glass that eliminates the UV content of the light source is somewhat counterproductive. While it will extend the "life" of the optical brighteners, it prevents them from actively fluorescing on display such that the artist's preferred cool-white appearance of this paper will not be observed by the viewer.

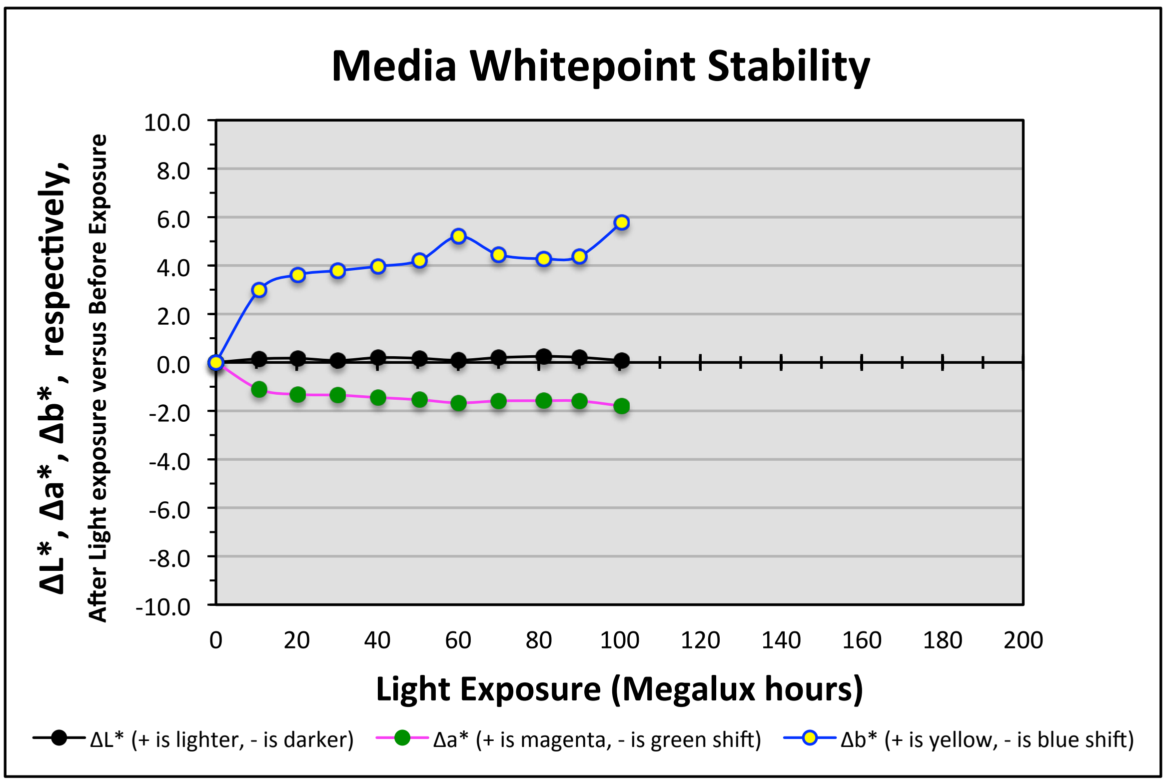
The choice of Sepia toner for this print sample is probably atypical because artists who want the very warm brown image hue afforded by sepia toning generally choose warmer white papers to begin with as well, and the Ilford Digital Gallerie RC is very much in the "cool-white" category of papers. Nevertheless, the sample was added to testing for completeness and to determine if a Sepia toner might change the outcome of the test compared to selenium toning or no toning at all. In fact it does, not by a huge amount, but significant nonetheless! The Sepia toning step and extended washing step is a more aggressive chemical treatment and may be leaching some of the optical brighteners from the emulsion. Additionally, the fine colloidal silver particles have taken on a brown reflectivity which means they are absorbing more blue light and perhaps more UV energy as well. This toning outcome may therefore be imparting some protective light filtering properties for the remaining OBA content, and the media white point is therefore no longer "cool-white" in appearance.

MHMG 2014-02-04: The dips in the graphs at 60 Mluxhrs and recovery at 70 Mluxhrs were not measurement errors. The 60 Mluxhr measurements were delayed a few weeks after removing the sample from the light fade unit. The temporary "dark storage" period caused a phenomenon I call "light-induced low intensity staining (LILIS). Additional media yellowing occurs which can be partially or fully reversed with more light exposure of sufficient intensity (as evidenced by the 70 Mluxhr exposure results), but the stain will return again with further storage in low intensity or dark storage environments. The LILIS behavior appears to be related to optical brighteners in the media, but more research is needed.

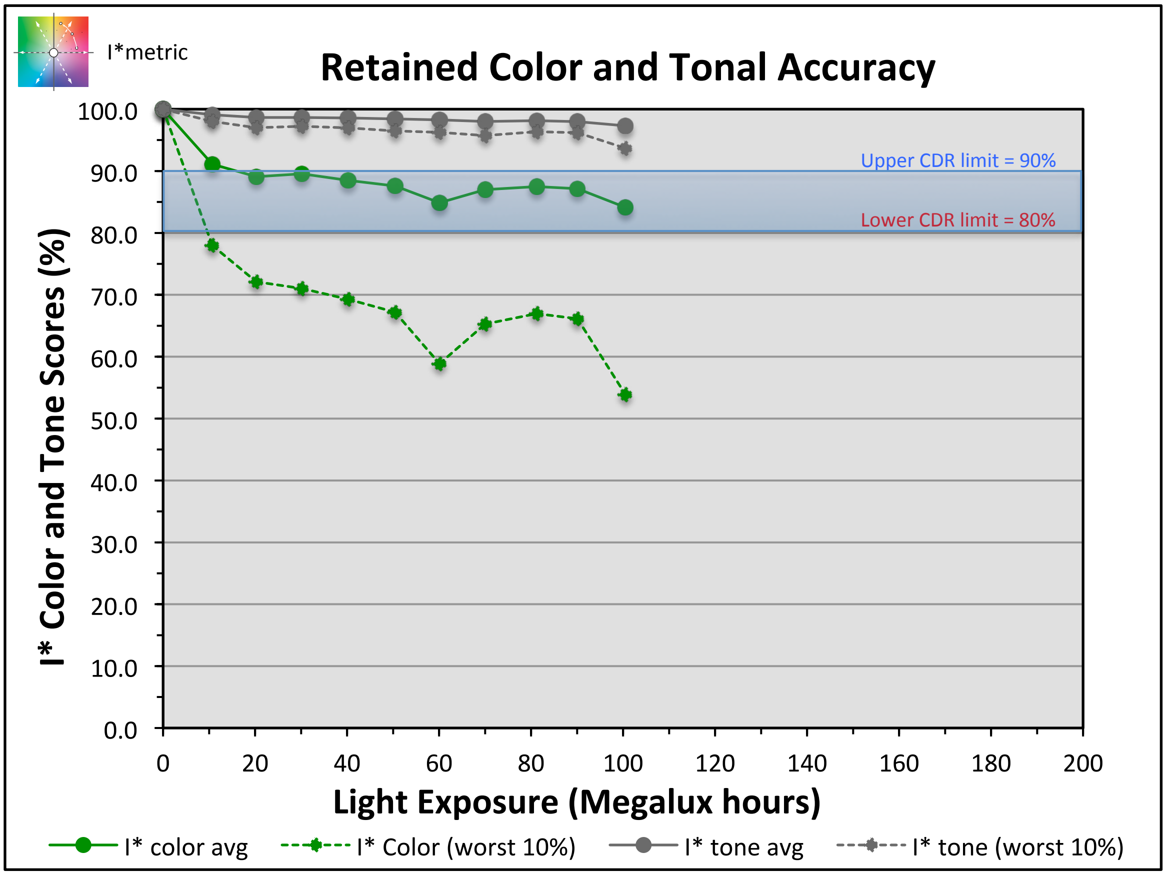
Notes/Comments:

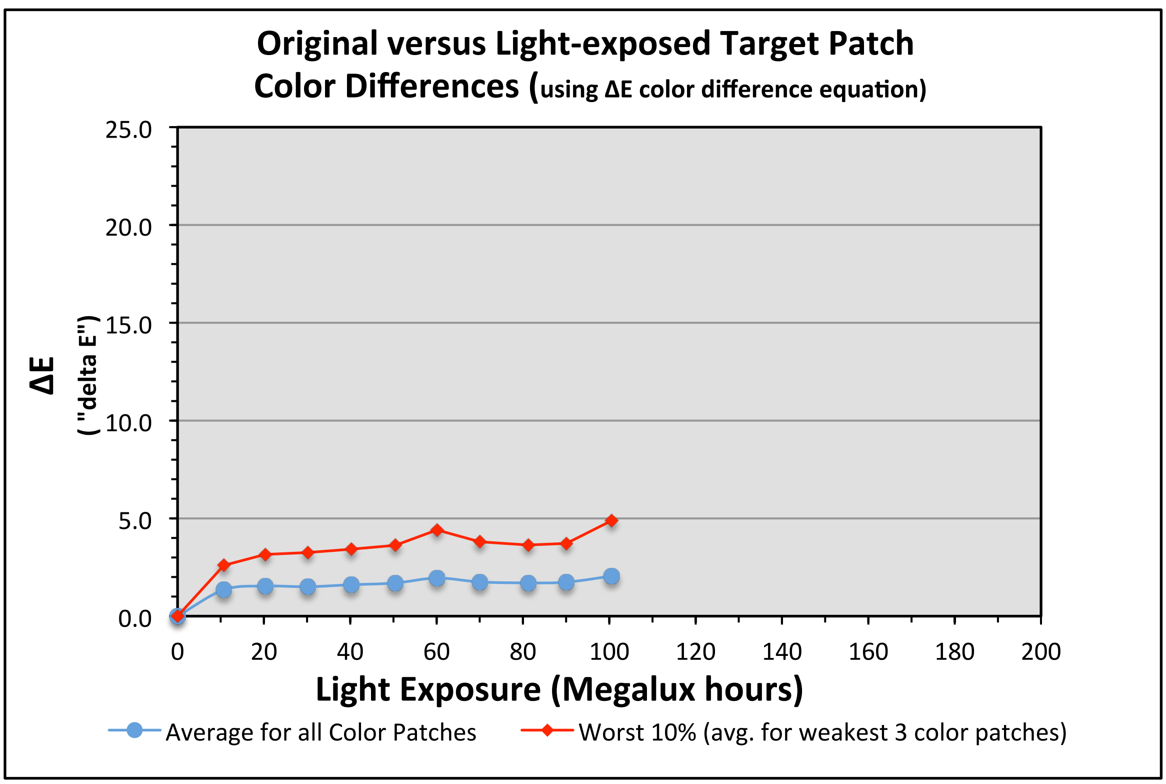
graphs:

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating

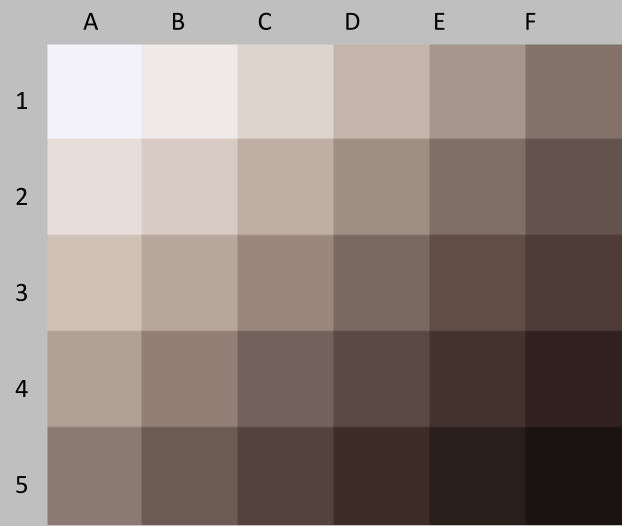


Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating

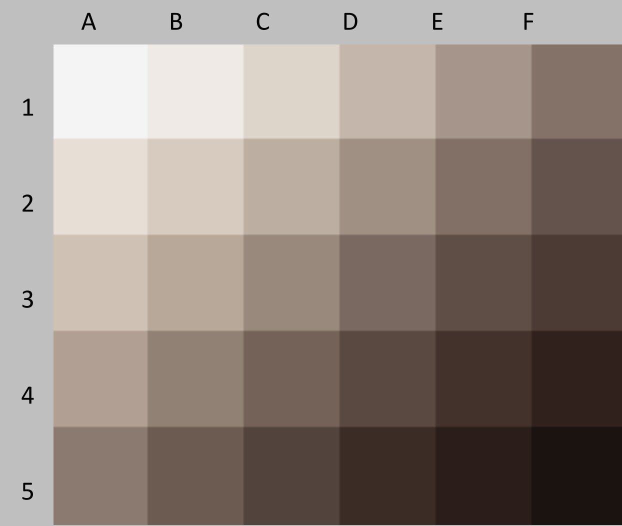




Values: *Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating*



Original Print Colors before light exposure



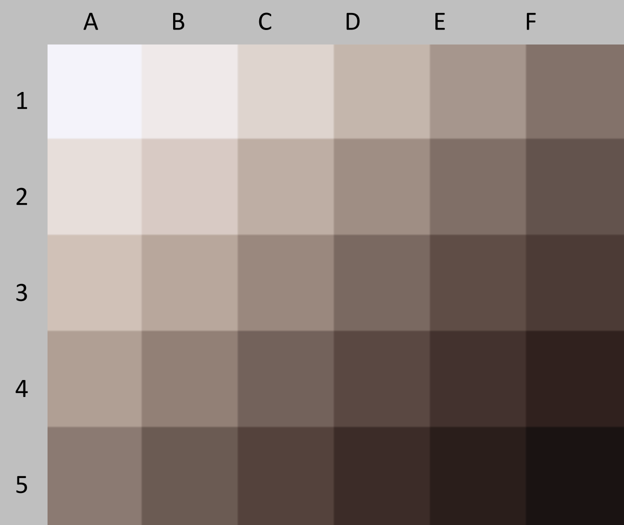
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	71.7	3.2	96.1	96.2	1.4	0.3	-3.3	-0.3
B1	Highlight L* = 96	79.6	2.4	92.9	93.0	1.8	0.9	0.7	2.9
C1	Highlight L* = 89	85.1	1.9	85.5	85.6	3.0	2.3	3.7	5.5
D1	Highlight L* = 78	90.0	1.4	75.0	75.0	4.3	3.8	6.6	7.9
E1	Midtone L* = 66	93.5	1.1	63.2	63.1	5.2	4.9	7.4	8.5
F1	Midtone L* = 52	95.0	1.0	49.4	49.4	5.9	5.6	6.8	7.7
A1	Highlight L* = 92	82.6	2.2	88.9	89.1	2.7	1.8	2.7	4.6
B2	Highlight L* = 85	87.2	1.7	82.2	82.3	3.5	2.9	5.2	6.8
C2	Highlight L* = 75	91.0	1.4	72.1	72.1	4.6	4.1	6.7	8.0
D2	Midtone L* = 63	93.4	1.1	60.6	60.6	5.4	5.0	7.6	8.6
E2	Midtone L* = 50	95.3	0.9	48.4	48.5	5.9	5.6	7.1	7.9
F2	Midtone L* = 38	95.9	0.9	36.8	36.8	6.5	6.1	6.4	7.2
A3	Highlight L* = 82	87.9	1.6	79.3	79.3	3.9	3.3	6.6	8.1
B3	Midtone L* = 72	90.2	1.4	69.9	70.0	4.8	4.4	7.9	9.3
C3	Midtone L* = 60	93.4	1.1	58.0	58.0	5.5	5.1	7.6	8.7
D3	Midtone L* = 47	95.1	1.0	45.7	45.8	6.1	5.8	7.1	8.0
E3	Midtone L* = 35	95.5	0.9	34.6	34.7	6.6	6.3	6.8	7.6
F3	Shadow L* = 25	94.2	1.1	26.8	26.8	6.9	6.6	6.2	7.2
A4	Midtone L* = 69	91.9	1.3	66.5	66.5	5.0	4.6	7.5	8.7
B4	Midtone L* = 57	93.8	1.1	54.8	54.8	5.7	5.3	7.6	8.6
C4	Midtone L* = 44	95.1	1.0	43.0	43.0	6.3	5.9	7.2	8.1
D4	Midtone L* = 32	93.6	1.1	32.5	32.4	6.7	6.4	6.5	7.6
E4	Shadow L* = 20	93.0	1.2	22.6	22.6	7.2	6.8	5.6	6.7
F4	Shadow L* = 10	89.1	1.5	14.7	14.6	7.0	6.6	4.6	6.1
A5	Midtone L* = 55	94.8	1.0	52.6	52.5	5.8	5.4	7.3	8.2
B5	Midtone L* = 41	95.6	0.9	40.0	39.9	6.4	6.1	7.0	7.9
C5	Midtone L* = 29	95.1	1.0	29.9	30.0	6.8	6.4	6.5	7.4
D5	Shadow L* = 15	92.8	1.2	19.8	19.7	6.9	6.5	5.8	6.9
E5	Shadow L* = 5	87.8	1.7	12.5	12.4	6.3	5.9	4.1	5.7
F5	Max Black	94.2	1.1	6.7	6.6	3.5	3.1	2.4	3.3

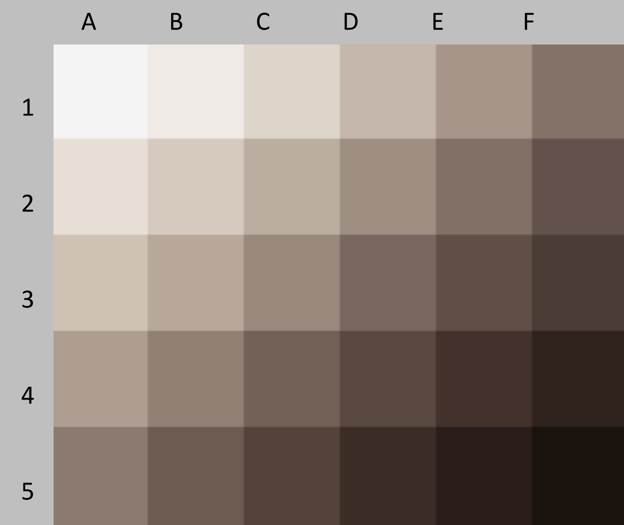
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	91.1	99.1	1.3
Worst 10% (3 lowest scoring patches)	78.0	98.0	2.6

10 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



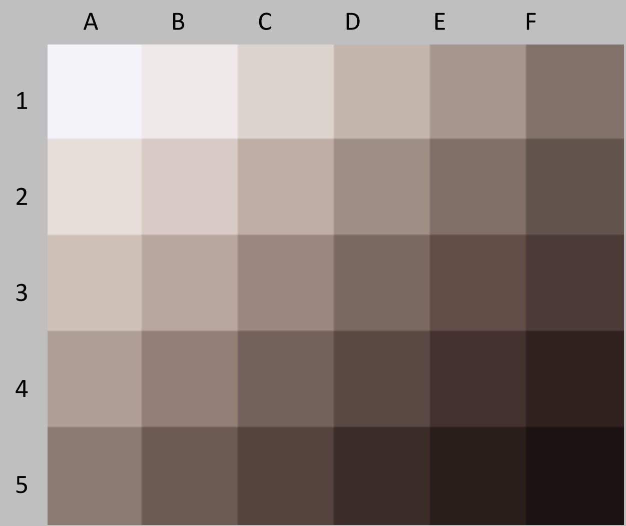
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	64.7	3.9	96.1	96.2	1.4	0.1	-3.3	0.3
B1	Highlight L* = 96	74.0	3.0	92.9	93.0	1.8	0.8	0.7	3.4
C1	Highlight L* = 89	80.6	2.3	85.5	85.5	3.0	2.2	3.7	5.9
D1	Highlight L* = 78	87.1	1.7	75.0	74.9	4.3	3.7	6.6	8.2
E1	Midtone L* = 66	91.8	1.3	63.2	63.1	5.2	4.7	7.4	8.6
F1	Midtone L* = 52	93.5	1.1	49.4	49.4	5.9	5.5	6.8	7.9
A1	Highlight L* = 92	77.7	2.6	88.9	88.9	2.7	1.6	2.7	5.1
B2	Highlight L* = 85	83.6	2.1	82.2	82.1	3.5	2.8	5.2	7.1
C2	Highlight L* = 75	88.0	1.7	72.1	71.9	4.6	4.0	6.7	8.2
D2	Midtone L* = 63	90.9	1.4	60.6	60.6	5.4	4.9	7.6	8.8
E2	Midtone L* = 50	94.5	1.0	48.4	48.4	5.9	5.5	7.1	8.0
F2	Midtone L* = 38	94.7	1.0	36.8	36.6	6.5	6.1	6.4	7.3
A3	Highlight L* = 82	85.5	1.9	79.3	79.1	3.9	3.2	6.6	8.3
B3	Midtone L* = 72	88.0	1.6	69.9	69.9	4.8	4.2	7.9	9.5
C3	Midtone L* = 60	91.3	1.3	58.0	58.0	5.5	5.0	7.6	8.9
D3	Midtone L* = 47	94.1	1.1	45.7	45.7	6.1	5.6	7.1	8.1
E3	Midtone L* = 35	94.3	1.0	34.6	34.7	6.6	6.2	6.8	7.7
F3	Shadow L* = 25	94.5	1.0	26.8	26.7	6.9	6.5	6.2	7.1
A4	Midtone L* = 69	89.6	1.5	66.5	66.4	5.0	4.5	7.5	8.9
B4	Midtone L* = 57	92.7	1.2	54.8	54.7	5.7	5.2	7.6	8.7
C4	Midtone L* = 44	94.7	1.0	43.0	42.9	6.3	5.8	7.2	8.1
D4	Midtone L* = 32	93.4	1.1	32.5	32.4	6.7	6.3	6.5	7.6
E4	Shadow L* = 20	93.0	1.2	22.6	22.5	7.2	6.7	5.6	6.6
F4	Shadow L* = 10	88.2	1.6	14.7	14.8	7.0	6.4	4.6	6.1
A5	Midtone L* = 55	92.9	1.2	52.6	52.6	5.8	5.3	7.3	8.3
B5	Midtone L* = 41	94.6	1.0	40.0	39.9	6.4	6.0	7.0	8.0
C5	Midtone L* = 29	92.9	1.2	29.9	30.0	6.8	6.3	6.5	7.6
D5	Shadow L* = 15	91.9	1.3	19.8	19.7	6.9	6.4	5.8	7.0
E5	Shadow L* = 5	88.1	1.6	12.5	12.5	6.3	5.8	4.1	5.7
F5	Max Black	92.3	1.2	6.7	6.7	3.5	3.2	2.4	3.5

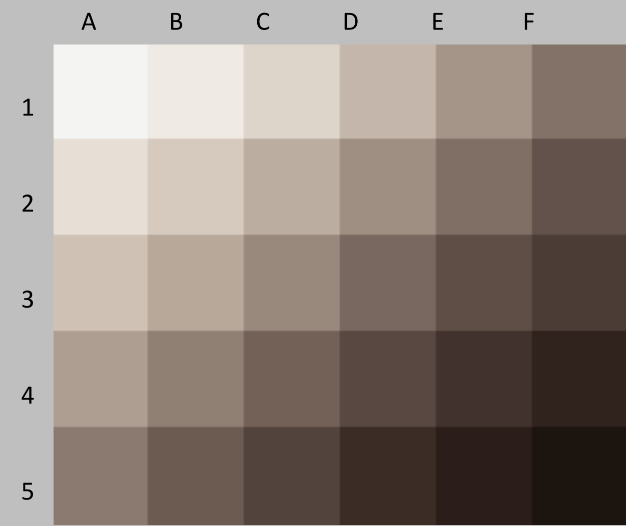
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	89.1	98.6	1.5
Worst 10% (3 lowest scoring patches)	72.1	97.0	3.2

20 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



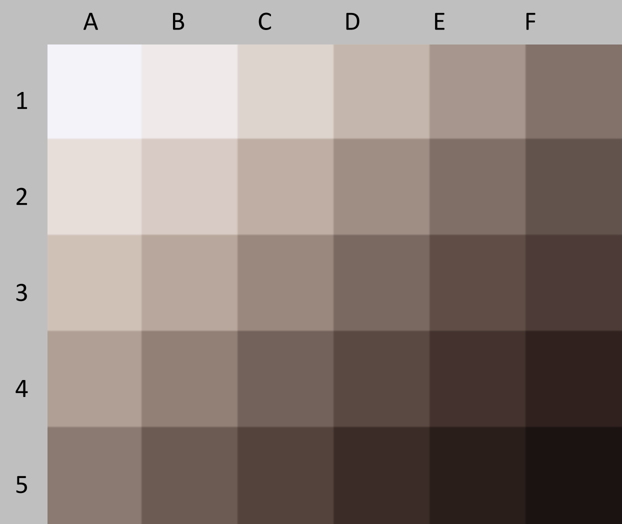
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	62.9	4.0	96.1	96.1	1.4	0.1	-3.3	0.5
B1	Highlight L* = 96	72.6	3.1	92.9	92.9	1.8	0.7	0.7	3.6
C1	Highlight L* = 89	80.7	2.3	85.5	85.4	3.0	2.1	3.7	5.9
D1	Highlight L* = 78	87.5	1.7	75.0	74.8	4.3	3.6	6.6	8.1
E1	Midtone L* = 66	92.5	1.2	63.2	62.9	5.2	4.7	7.4	8.5
F1	Midtone L* = 52	94.3	1.1	49.4	49.3	5.9	5.4	6.8	7.7
A1	Highlight L* = 92	77.5	2.6	88.9	89.0	2.7	1.6	2.7	5.1
B2	Highlight L* = 85	84.2	2.0	82.2	82.1	3.5	2.7	5.2	7.0
C2	Highlight L* = 75	88.7	1.6	72.1	71.9	4.6	3.9	6.7	8.1
D2	Midtone L* = 63	92.1	1.3	60.6	60.4	5.4	4.8	7.6	8.7
E2	Midtone L* = 50	94.8	1.0	48.4	48.3	5.9	5.4	7.1	7.9
F2	Midtone L* = 38	95.7	0.9	36.8	36.6	6.5	5.9	6.4	7.1
A3	Highlight L* = 82	84.4	2.0	79.3	79.2	3.9	3.1	6.6	8.4
B3	Midtone L* = 72	88.8	1.6	69.9	69.8	4.8	4.2	7.9	9.4
C3	Midtone L* = 60	91.8	1.3	58.0	57.9	5.5	4.9	7.6	8.8
D3	Midtone L* = 47	95.0	1.0	45.7	45.6	6.1	5.5	7.1	7.9
E3	Midtone L* = 35	95.4	0.9	34.6	34.6	6.6	6.0	6.8	7.5
F3	Shadow L* = 25	94.8	1.0	26.8	26.8	6.9	6.3	6.2	7.0
A4	Midtone L* = 69	90.8	1.4	66.5	66.3	5.0	4.4	7.5	8.8
B4	Midtone L* = 57	93.6	1.1	54.8	54.7	5.7	5.1	7.6	8.6
C4	Midtone L* = 44	95.7	0.9	43.0	42.8	6.3	5.7	7.2	7.9
D4	Midtone L* = 32	93.3	1.2	32.5	32.3	6.7	6.1	6.5	7.5
E4	Shadow L* = 20	93.4	1.1	22.6	22.5	7.2	6.5	5.6	6.5
F4	Shadow L* = 10	89.4	1.5	14.7	14.8	7.0	6.2	4.6	5.9
A5	Midtone L* = 55	93.1	1.2	52.6	52.5	5.8	5.2	7.3	8.3
B5	Midtone L* = 41	95.4	0.9	40.0	39.9	6.4	5.8	7.0	7.8
C5	Midtone L* = 29	94.3	1.0	29.9	29.9	6.8	6.1	6.5	7.4
D5	Shadow L* = 15	92.0	1.3	19.8	19.7	6.9	6.3	5.8	6.9
E5	Shadow L* = 5	88.9	1.6	12.5	12.7	6.3	5.6	4.1	5.5
F5	Max Black	93.0	1.3	6.7	7.2	3.5	3.3	2.4	3.5

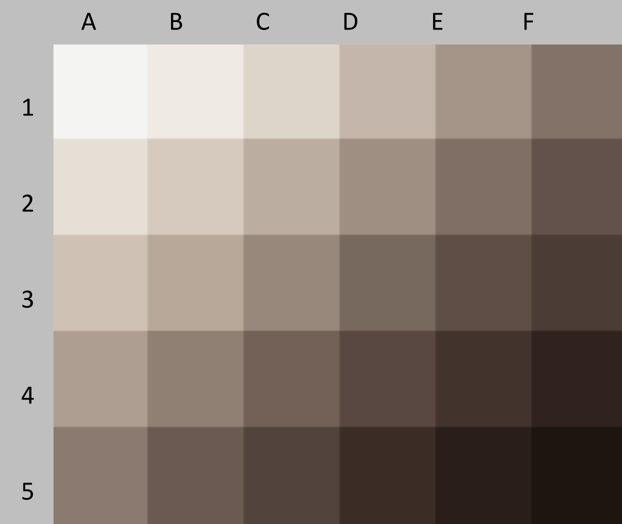
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	89.5	98.7	1.5
Worst 10% (3 lowest scoring patches)	71.0	97.2	3.3

30 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



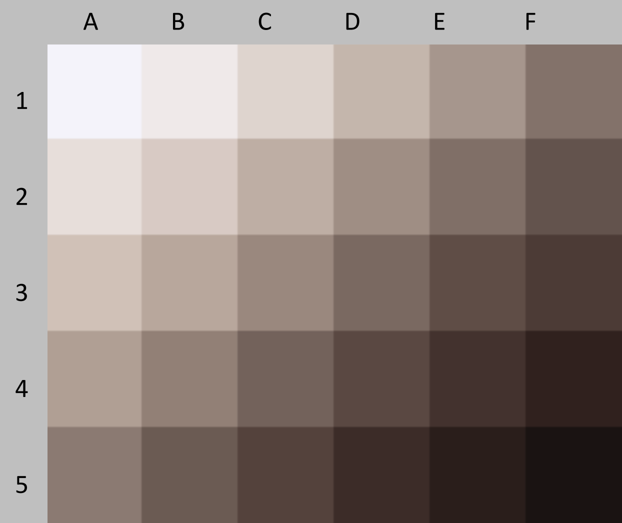
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	60.8	4.2	96.1	96.3	1.4	0.0	-3.3	0.7
B1	Highlight L* = 96	70.8	3.3	92.9	93.0	1.8	0.6	0.7	3.7
C1	Highlight L* = 89	79.7	2.4	85.5	85.4	3.0	2.0	3.7	6.0
D1	Highlight L* = 78	86.5	1.8	75.0	74.8	4.3	3.5	6.6	8.2
E1	Midtone L* = 66	91.7	1.3	63.2	62.9	5.2	4.6	7.4	8.5
F1	Midtone L* = 52	93.2	1.2	49.4	49.3	5.9	5.3	6.8	7.8
A1	Highlight L* = 92	76.3	2.8	88.9	88.9	2.7	1.5	2.7	5.2
B2	Highlight L* = 85	82.9	2.1	82.2	82.1	3.5	2.6	5.2	7.1
C2	Highlight L* = 75	88.1	1.6	72.1	71.8	4.6	3.8	6.7	8.2
D2	Midtone L* = 63	91.4	1.3	60.6	60.4	5.4	4.7	7.6	8.7
E2	Midtone L* = 50	94.4	1.0	48.4	48.3	5.9	5.3	7.1	7.9
F2	Midtone L* = 38	95.2	1.0	36.8	36.6	6.5	5.8	6.4	7.0
A3	Highlight L* = 82	84.1	2.0	79.3	79.1	3.9	3.1	6.6	8.4
B3	Midtone L* = 72	87.0	1.7	69.9	69.8	4.8	4.1	7.9	9.5
C3	Midtone L* = 60	91.1	1.4	58.0	57.8	5.5	4.9	7.6	8.8
D3	Midtone L* = 47	94.5	1.0	45.7	45.5	6.1	5.4	7.1	7.9
E3	Midtone L* = 35	95.2	1.0	34.6	34.5	6.6	5.9	6.8	7.4
F3	Shadow L* = 25	93.4	1.1	26.8	26.8	6.9	6.2	6.2	7.1
A4	Midtone L* = 69	89.7	1.5	66.5	66.3	5.0	4.3	7.5	8.8
B4	Midtone L* = 57	92.5	1.2	54.8	54.7	5.7	5.0	7.6	8.6
C4	Midtone L* = 44	95.2	1.0	43.0	42.8	6.3	5.6	7.2	7.9
D4	Midtone L* = 32	92.9	1.2	32.5	32.3	6.7	6.1	6.5	7.5
E4	Shadow L* = 20	92.0	1.3	22.6	22.6	7.2	6.3	5.6	6.5
F4	Shadow L* = 10	87.4	1.7	14.7	14.8	7.0	6.1	4.6	6.0
A5	Midtone L* = 55	93.4	1.2	52.6	52.4	5.8	5.1	7.3	8.2
B5	Midtone L* = 41	94.8	1.0	40.0	39.8	6.4	5.7	7.0	7.8
C5	Midtone L* = 29	93.7	1.1	29.9	29.9	6.8	6.0	6.5	7.4
D5	Shadow L* = 15	91.5	1.3	19.8	19.8	6.9	6.1	5.8	6.8
E5	Shadow L* = 5	85.5	1.9	12.5	12.6	6.3	5.5	4.1	5.8
F5	Max Black	90.4	1.6	6.7	7.4	3.5	3.1	2.4	3.7

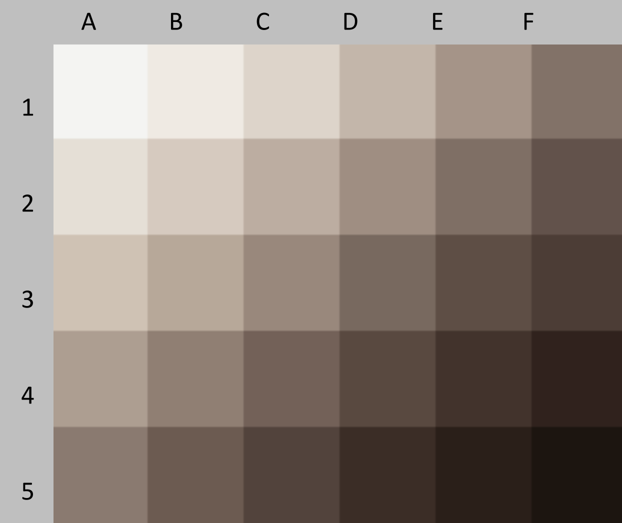
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	88.5	98.6	1.6
Worst 10% (3 lowest scoring patches)	69.3	97.0	3.4

40 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



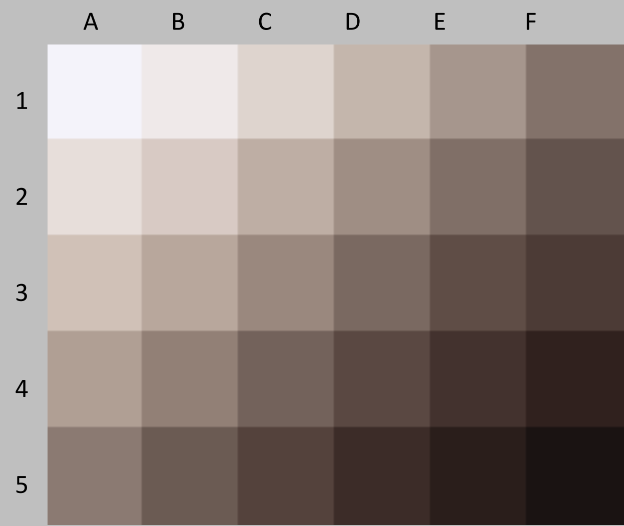
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	58.1	4.5	96.1	96.2	1.4	-0.1	-3.3	0.9
B1	Highlight L* = 96	68.8	3.5	92.9	92.9	1.8	0.5	0.7	3.9
C1	Highlight L* = 89	78.1	2.6	85.5	85.4	3.0	2.0	3.7	6.1
D1	Highlight L* = 78	85.6	1.9	75.0	74.7	4.3	3.5	6.6	8.3
E1	Midtone L* = 66	90.8	1.4	63.2	62.9	5.2	4.5	7.4	8.6
F1	Midtone L* = 52	91.9	1.3	49.4	49.4	5.9	5.3	6.8	7.9
A1	Highlight L* = 92	74.7	2.9	88.9	88.9	2.7	1.4	2.7	5.3
B2	Highlight L* = 85	81.8	2.2	82.2	82.0	3.5	2.6	5.2	7.2
C2	Highlight L* = 75	86.9	1.8	72.1	71.9	4.6	3.8	6.7	8.3
D2	Midtone L* = 63	90.3	1.4	60.6	60.4	5.4	4.7	7.6	8.8
E2	Midtone L* = 50	94.0	1.1	48.4	48.3	5.9	5.2	7.1	7.9
F2	Midtone L* = 38	94.3	1.1	36.8	36.6	6.5	5.8	6.4	7.1
A3	Highlight L* = 82	83.0	2.1	79.3	79.1	3.9	3.0	6.6	8.5
B3	Midtone L* = 72	86.0	1.8	69.9	69.8	4.8	4.1	7.9	9.6
C3	Midtone L* = 60	90.3	1.4	58.0	57.9	5.5	4.8	7.6	8.9
D3	Midtone L* = 47	93.5	1.1	45.7	45.6	6.1	5.4	7.1	8.0
E3	Midtone L* = 35	94.2	1.0	34.6	34.6	6.6	5.9	6.8	7.5
F3	Shadow L* = 25	93.0	1.2	26.8	26.9	6.9	6.2	6.2	7.1
A4	Midtone L* = 69	89.1	1.5	66.5	66.3	5.0	4.3	7.5	8.9
B4	Midtone L* = 57	91.7	1.3	54.8	54.7	5.7	5.0	7.6	8.7
C4	Midtone L* = 44	93.7	1.1	43.0	42.9	6.3	5.6	7.2	8.1
D4	Midtone L* = 32	92.4	1.2	32.5	32.4	6.7	6.0	6.5	7.5
E4	Shadow L* = 20	91.5	1.3	22.6	22.6	7.2	6.3	5.6	6.6
F4	Shadow L* = 10	86.1	1.8	14.7	14.9	7.0	6.0	4.6	6.1
A5	Midtone L* = 55	92.4	1.2	52.6	52.5	5.8	5.1	7.3	8.3
B5	Midtone L* = 41	94.2	1.1	40.0	39.9	6.4	5.7	7.0	7.8
C5	Midtone L* = 29	93.5	1.1	29.9	30.0	6.8	6.0	6.5	7.4
D5	Shadow L* = 15	91.1	1.4	19.8	20.0	6.9	6.1	5.8	6.8
E5	Shadow L* = 5	85.7	1.9	12.5	12.8	6.3	5.4	4.1	5.8
F5	Max Black	91.3	1.7	6.7	7.6	3.5	3.1	2.4	3.6

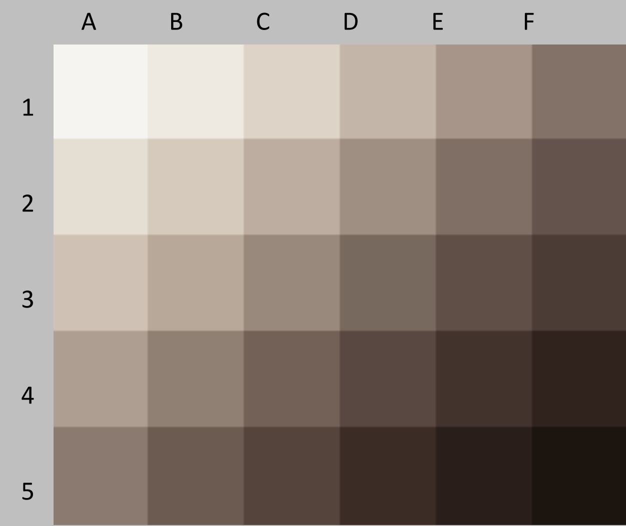
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	87.6	98.4	1.7
Worst 10% (3 lowest scoring patches)	67.2	96.5	3.6

50 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



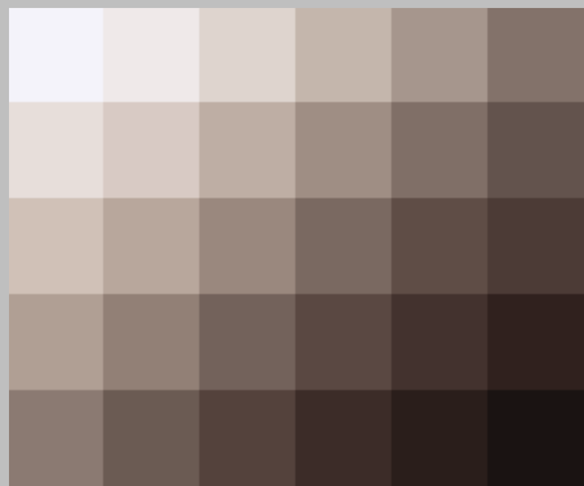
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	47.7	5.5	96.1	96.2	1.4	-0.3	-3.3	1.9
B1	Highlight L* = 96	61.0	4.2	92.9	92.8	1.8	0.5	0.7	4.7
C1	Highlight L* = 89	72.2	3.1	85.5	85.2	3.0	1.9	3.7	6.7
D1	Highlight L* = 78	81.7	2.3	75.0	74.7	4.3	3.5	6.6	8.7
E1	Midtone L* = 66	88.2	1.6	63.2	63.0	5.2	4.5	7.4	8.9
F1	Midtone L* = 52	90.9	1.4	49.4	49.3	5.9	5.2	6.8	8.0
A1	Highlight L* = 92	68.0	3.5	88.9	88.8	2.7	1.4	2.7	6.0
B2	Highlight L* = 85	76.9	2.7	82.2	81.9	3.5	2.5	5.2	7.7
C2	Highlight L* = 75	82.6	2.2	72.1	71.8	4.6	3.7	6.7	8.7
D2	Midtone L* = 63	87.6	1.7	60.6	60.4	5.4	4.6	7.6	9.1
E2	Midtone L* = 50	91.9	1.3	48.4	48.3	5.9	5.2	7.1	8.1
F2	Midtone L* = 38	92.4	1.2	36.8	36.7	6.5	5.8	6.4	7.4
A3	Highlight L* = 82	78.5	2.5	79.3	79.1	3.9	3.0	6.6	9.0
B3	Midtone L* = 72	85.1	1.9	69.9	69.6	4.8	4.0	7.9	9.7
C3	Midtone L* = 60	89.8	1.5	58.0	57.9	5.5	4.8	7.6	8.9
D3	Midtone L* = 47	91.5	1.3	45.7	45.7	6.1	5.4	7.1	8.3
E3	Midtone L* = 35	92.1	1.3	34.6	34.8	6.6	5.9	6.8	7.8
F3	Shadow L* = 25	93.5	1.1	26.8	26.6	6.9	6.2	6.2	7.1
A4	Midtone L* = 69	86.5	1.8	66.5	66.3	5.0	4.3	7.5	9.1
B4	Midtone L* = 57	90.3	1.4	54.8	54.6	5.7	5.0	7.6	8.8
C4	Midtone L* = 44	93.0	1.2	43.0	42.9	6.3	5.6	7.2	8.1
D4	Midtone L* = 32	92.5	1.2	32.5	32.4	6.7	6.0	6.5	7.5
E4	Shadow L* = 20	90.5	1.4	22.6	22.6	7.2	6.3	5.6	6.7
F4	Shadow L* = 10	84.9	1.9	14.7	14.9	7.0	5.9	4.6	6.2
A5	Midtone L* = 55	90.1	1.4	52.6	52.6	5.8	5.1	7.3	8.5
B5	Midtone L* = 41	92.5	1.2	40.0	39.9	6.4	5.7	7.0	8.0
C5	Midtone L* = 29	91.1	1.3	29.9	30.0	6.8	6.0	6.5	7.6
D5	Shadow L* = 15	89.8	1.5	19.8	19.8	6.9	6.1	5.8	7.0
E5	Shadow L* = 5	84.0	2.0	12.5	12.6	6.3	5.5	4.1	6.0
F5	Max Black	89.2	1.6	6.7	7.2	3.5	3.2	2.4	3.9

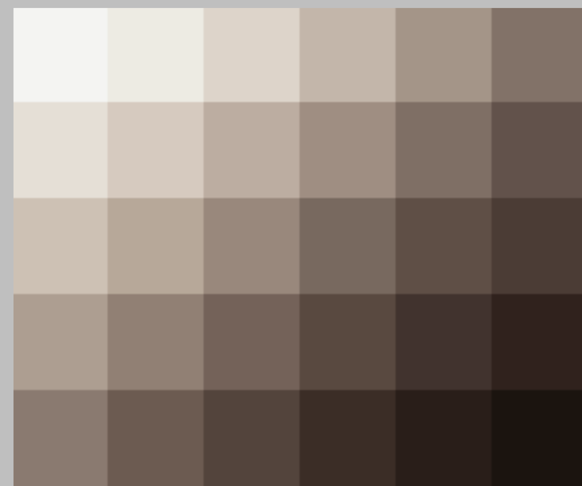
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	84.9	98.3	1.9
Worst 10% (3 lowest scoring patches)	58.9	96.2	4.4

60 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



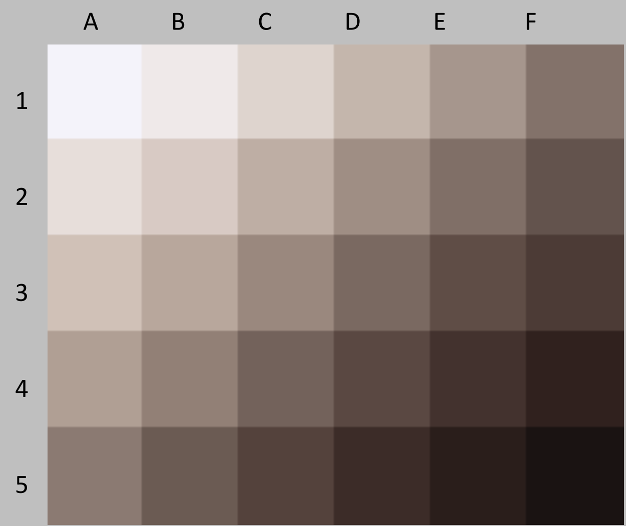
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	55.5	4.7	96.1	96.3	1.4	-0.2	-3.3	1.2
B1	Highlight L* = 96	67.0	3.6	92.9	92.9	1.8	0.5	0.7	4.1
C1	Highlight L* = 89	76.6	2.7	85.5	85.4	3.0	1.9	3.7	6.3
D1	Highlight L* = 78	85.1	1.9	75.0	74.8	4.3	3.4	6.6	8.3
E1	Midtone L* = 66	90.5	1.4	63.2	62.9	5.2	4.5	7.4	8.6
F1	Midtone L* = 52	91.7	1.3	49.4	49.3	5.9	5.2	6.8	7.9
A1	Highlight L* = 92	73.3	3.0	88.9	88.9	2.7	1.4	2.7	5.4
B2	Highlight L* = 85	81.4	2.3	82.2	82.0	3.5	2.5	5.2	7.2
C2	Highlight L* = 75	86.9	1.8	72.1	71.7	4.6	3.8	6.7	8.2
D2	Midtone L* = 63	89.6	1.5	60.6	60.5	5.4	4.6	7.6	8.9
E2	Midtone L* = 50	93.7	1.1	48.4	48.3	5.9	5.2	7.1	7.9
F2	Midtone L* = 38	94.1	1.1	36.8	36.6	6.5	5.7	6.4	7.1
A3	Highlight L* = 82	83.8	2.1	79.3	79.0	3.9	3.0	6.6	8.4
B3	Midtone L* = 72	84.4	2.0	69.9	69.9	4.8	4.0	7.9	9.8
C3	Midtone L* = 60	89.5	1.5	58.0	57.9	5.5	4.8	7.6	8.9
D3	Midtone L* = 47	93.5	1.1	45.7	45.6	6.1	5.4	7.1	8.0
E3	Midtone L* = 35	93.0	1.2	34.6	34.8	6.6	5.8	6.8	7.6
F3	Shadow L* = 25	93.1	1.2	26.8	26.8	6.9	6.1	6.2	7.0
A4	Midtone L* = 69	87.5	1.7	66.5	66.5	5.0	4.2	7.5	9.0
B4	Midtone L* = 57	90.5	1.4	54.8	54.8	5.7	5.0	7.6	8.8
C4	Midtone L* = 44	92.5	1.2	43.0	43.0	6.3	5.5	7.2	8.2
D4	Midtone L* = 32	92.1	1.3	32.5	32.5	6.7	6.0	6.5	7.5
E4	Shadow L* = 20	91.9	1.3	22.6	22.7	7.2	6.3	5.6	6.4
F4	Shadow L* = 10	86.5	1.8	14.7	15.0	7.0	5.9	4.6	6.0
A5	Midtone L* = 55	92.1	1.3	52.6	52.6	5.8	5.0	7.3	8.3
B5	Midtone L* = 41	93.8	1.1	40.0	39.9	6.4	5.7	7.0	7.8
C5	Midtone L* = 29	93.6	1.1	29.9	30.0	6.8	6.0	6.5	7.3
D5	Shadow L* = 15	91.5	1.3	19.8	20.0	6.9	6.0	5.8	6.7
E5	Shadow L* = 5	85.0	1.9	12.5	12.7	6.3	5.4	4.1	5.8
F5	Max Black	90.1	1.6	6.7	7.2	3.5	3.2	2.4	3.8

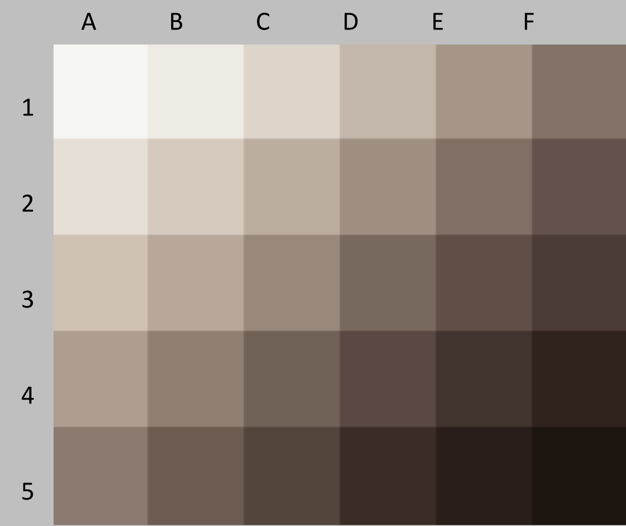
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	87.0	98.0	1.7
Worst 10% (3 lowest scoring patches)	65.3	95.7	3.8

70 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



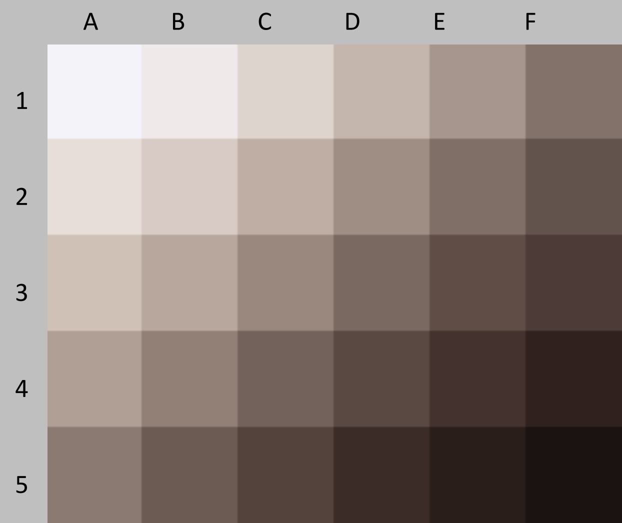
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	57.2	4.6	96.1	96.3	1.4	-0.2	-3.3	1.0
B1	Highlight L* = 96	68.7	3.5	92.9	92.9	1.8	0.5	0.7	3.9
C1	Highlight L* = 89	78.8	2.5	85.5	85.3	3.0	1.9	3.7	6.0
D1	Highlight L* = 78	86.1	1.8	75.0	74.8	4.3	3.4	6.6	8.2
E1	Midtone L* = 66	91.1	1.4	63.2	63.0	5.2	4.4	7.4	8.5
F1	Midtone L* = 52	92.8	1.2	49.4	49.3	5.9	5.1	6.8	7.7
A1	Highlight L* = 92	75.0	2.9	88.9	88.9	2.7	1.4	2.7	5.2
B2	Highlight L* = 85	82.6	2.2	82.2	82.0	3.5	2.5	5.2	7.1
C2	Highlight L* = 75	87.7	1.7	72.1	71.8	4.6	3.7	6.7	8.1
D2	Midtone L* = 63	90.6	1.4	60.6	60.4	5.4	4.6	7.6	8.7
E2	Midtone L* = 50	93.6	1.1	48.4	48.3	5.9	5.1	7.1	7.8
F2	Midtone L* = 38	93.4	1.1	36.8	36.6	6.5	5.6	6.4	7.1
A3	Highlight L* = 82	83.4	2.1	79.3	79.1	3.9	2.9	6.6	8.4
B3	Midtone L* = 72	87.3	1.7	69.9	69.8	4.8	4.0	7.9	9.4
C3	Midtone L* = 60	91.0	1.4	58.0	57.9	5.5	4.7	7.6	8.7
D3	Midtone L* = 47	93.3	1.1	45.7	45.6	6.1	5.3	7.1	8.0
E3	Midtone L* = 35	92.6	1.2	34.6	34.7	6.6	5.7	6.8	7.6
F3	Shadow L* = 25	92.5	1.2	26.8	26.8	6.9	6.0	6.2	7.0
A4	Midtone L* = 69	89.1	1.5	66.5	66.4	5.0	4.2	7.5	8.8
B4	Midtone L* = 57	92.2	1.3	54.8	54.7	5.7	4.9	7.6	8.6
C4	Midtone L* = 44	93.3	1.1	43.0	42.9	6.3	5.5	7.2	8.0
D4	Midtone L* = 32	92.8	1.2	32.5	32.4	6.7	5.9	6.5	7.4
E4	Shadow L* = 20	91.1	1.3	22.6	22.6	7.2	6.2	5.6	6.5
F4	Shadow L* = 10	85.8	1.9	14.7	14.9	7.0	5.8	4.6	6.0
A5	Midtone L* = 55	92.4	1.2	52.6	52.6	5.8	5.0	7.3	8.2
B5	Midtone L* = 41	93.7	1.1	40.0	39.9	6.4	5.6	7.0	7.8
C5	Midtone L* = 29	92.5	1.2	29.9	30.0	6.8	5.9	6.5	7.4
D5	Shadow L* = 15	90.4	1.4	19.8	19.9	6.9	6.0	5.8	6.8
E5	Shadow L* = 5	84.4	2.0	12.5	12.7	6.3	5.3	4.1	5.9
F5	Max Black	89.5	1.7	6.7	7.4	3.5	3.1	2.4	3.8

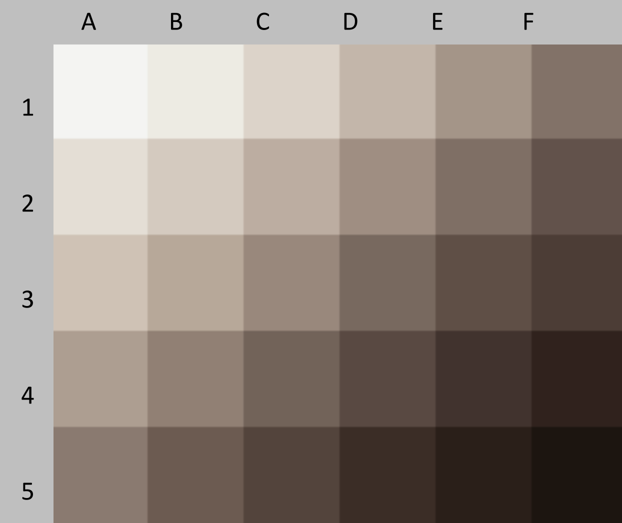
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	87.5	98.1	1.7
Worst 10% (3 lowest scoring patches)	67.0	96.4	3.6

80 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



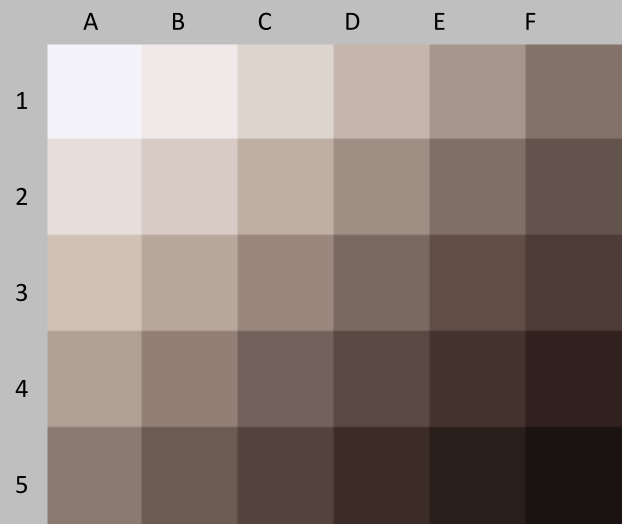
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	56.2	4.7	96.1	96.3	1.4	-0.2	-3.3	1.1
B1	Highlight L* = 96	67.9	3.5	92.9	92.9	1.8	0.5	0.7	4.0
C1	Highlight L* = 89	78.0	2.6	85.5	85.2	3.0	1.9	3.7	6.1
D1	Highlight L* = 78	85.9	1.9	75.0	74.7	4.3	3.4	6.6	8.2
E1	Midtone L* = 66	91.0	1.4	63.2	62.9	5.2	4.4	7.4	8.5
F1	Midtone L* = 52	92.1	1.3	49.4	49.3	5.9	5.1	6.8	7.8
A1	Highlight L* = 92	74.3	2.9	88.9	88.8	2.7	1.3	2.7	5.3
B2	Highlight L* = 85	82.0	2.2	82.2	81.9	3.5	2.5	5.2	7.1
C2	Highlight L* = 75	87.7	1.7	72.1	71.7	4.6	3.7	6.7	8.1
D2	Midtone L* = 63	90.2	1.4	60.6	60.4	5.4	4.6	7.6	8.8
E2	Midtone L* = 50	93.9	1.1	48.4	48.2	5.9	5.1	7.1	7.8
F2	Midtone L* = 38	93.8	1.1	36.8	36.6	6.5	5.7	6.4	7.1
A3	Highlight L* = 82	83.3	2.1	79.3	79.1	3.9	2.9	6.6	8.4
B3	Midtone L* = 72	85.8	1.8	69.9	69.8	4.8	4.0	7.9	9.6
C3	Midtone L* = 60	89.5	1.5	58.0	57.9	5.5	4.7	7.6	8.9
D3	Midtone L* = 47	93.2	1.2	45.7	45.6	6.1	5.3	7.1	8.0
E3	Midtone L* = 35	92.4	1.2	34.6	34.7	6.6	5.7	6.8	7.6
F3	Shadow L* = 25	92.0	1.3	26.8	26.9	6.9	6.0	6.2	7.0
A4	Midtone L* = 69	89.1	1.5	66.5	66.3	5.0	4.2	7.5	8.8
B4	Midtone L* = 57	91.2	1.3	54.8	54.7	5.7	4.9	7.6	8.7
C4	Midtone L* = 44	92.5	1.2	43.0	43.0	6.3	5.5	7.2	8.1
D4	Midtone L* = 32	92.0	1.3	32.5	32.4	6.7	5.9	6.5	7.5
E4	Shadow L* = 20	91.0	1.4	22.6	22.7	7.2	6.1	5.6	6.4
F4	Shadow L* = 10	85.7	1.9	14.7	15.0	7.0	5.8	4.6	6.0
A5	Midtone L* = 55	92.4	1.2	52.6	52.5	5.8	5.0	7.3	8.2
B5	Midtone L* = 41	93.6	1.1	40.0	39.8	6.4	5.6	7.0	7.8
C5	Midtone L* = 29	93.1	1.2	29.9	30.1	6.8	5.8	6.5	7.2
D5	Shadow L* = 15	90.7	1.4	19.8	20.0	6.9	5.8	5.8	6.7
E5	Shadow L* = 5	84.4	2.0	12.5	12.8	6.3	5.3	4.1	5.8
F5	Max Black	89.6	1.7	6.7	7.4	3.5	3.1	2.4	3.8

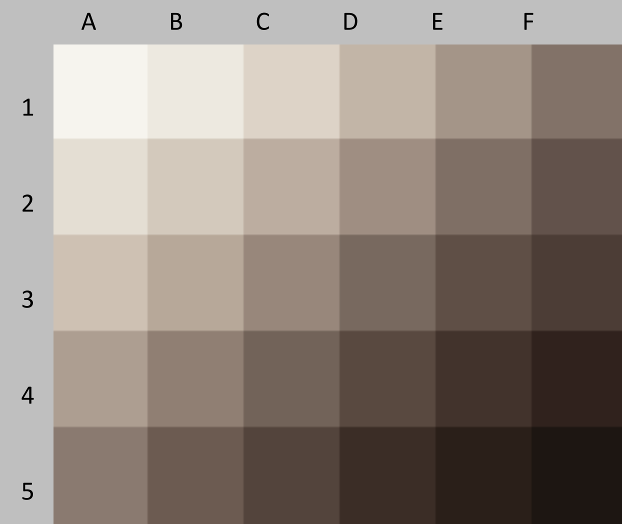
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	87.2	98.0	1.7
Worst 10% (3 lowest scoring patches)	66.1	96.2	3.7

90 Megalux hours

Durst Theta 51, Silver Halide Development Process (see notes), Ilford Galerie RC Digital Silver B&W paper – Sepia toned, no additional coating



Original Print Colors before light exposure



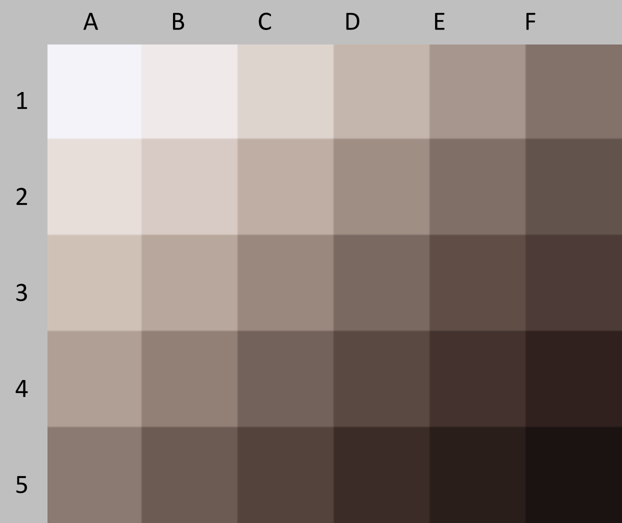
Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White	41.5	6.1	96.1	96.1	1.4	-0.4	-3.3	2.5
B1	Highlight L* = 96	55.9	4.7	92.9	92.7	1.8	0.3	0.7	5.1
C1	Highlight L* = 89	69.9	3.4	85.5	85.1	3.0	1.8	3.7	6.9
D1	Highlight L* = 78	81.0	2.3	75.0	74.6	4.3	3.4	6.6	8.7
E1	Midtone L* = 66	88.3	1.6	63.2	62.8	5.2	4.4	7.4	8.8
F1	Midtone L* = 52	90.5	1.4	49.4	49.3	5.9	5.1	6.8	8.0
A1	Highlight L* = 92	64.3	3.9	88.9	88.6	2.7	1.2	2.7	6.3
B2	Highlight L* = 85	75.5	2.9	82.2	81.8	3.5	2.5	5.2	7.8
C2	Highlight L* = 75	83.0	2.2	72.1	71.7	4.6	3.7	6.7	8.6
D2	Midtone L* = 63	87.5	1.7	60.6	60.3	5.4	4.6	7.6	9.1
E2	Midtone L* = 50	92.2	1.3	48.4	48.3	5.9	5.1	7.1	8.0
F2	Midtone L* = 38	92.8	1.2	36.8	36.6	6.5	5.7	6.4	7.2
A3	Highlight L* = 82	78.8	2.6	79.3	78.9	3.9	2.9	6.6	8.9
B3	Midtone L* = 72	82.3	2.2	69.9	69.7	4.8	3.9	7.9	9.9
C3	Midtone L* = 60	87.7	1.7	58.0	57.8	5.5	4.7	7.6	9.1
D3	Midtone L* = 47	91.9	1.3	45.7	45.6	6.1	5.3	7.1	8.1
E3	Midtone L* = 35	92.3	1.2	34.6	34.7	6.6	5.8	6.8	7.7
F3	Shadow L* = 25	92.2	1.2	26.8	27.0	6.9	6.0	6.2	7.0
A4	Midtone L* = 69	85.6	1.9	66.5	66.2	5.0	4.2	7.5	9.2
B4	Midtone L* = 57	89.5	1.5	54.8	54.6	5.7	4.9	7.6	8.9
C4	Midtone L* = 44	91.7	1.3	43.0	43.0	6.3	5.4	7.2	8.2
D4	Midtone L* = 32	91.5	1.3	32.5	32.5	6.7	5.9	6.5	7.5
E4	Shadow L* = 20	90.6	1.4	22.6	22.7	7.2	6.1	5.6	6.5
F4	Shadow L* = 10	86.3	1.8	14.7	15.0	7.0	5.8	4.6	5.9
A5	Midtone L* = 55	91.0	1.4	52.6	52.4	5.8	5.0	7.3	8.3
B5	Midtone L* = 41	92.8	1.2	40.0	39.8	6.4	5.6	7.0	7.9
C5	Midtone L* = 29	93.1	1.2	29.9	30.1	6.8	5.8	6.5	7.2
D5	Shadow L* = 15	90.3	1.4	19.8	20.1	6.9	5.8	5.8	6.7
E5	Shadow L* = 5	85.5	1.9	12.5	13.0	6.3	5.2	4.1	5.7
F5	Max Black	88.3	2.4	6.7	8.4	3.5	2.8	2.4	3.8

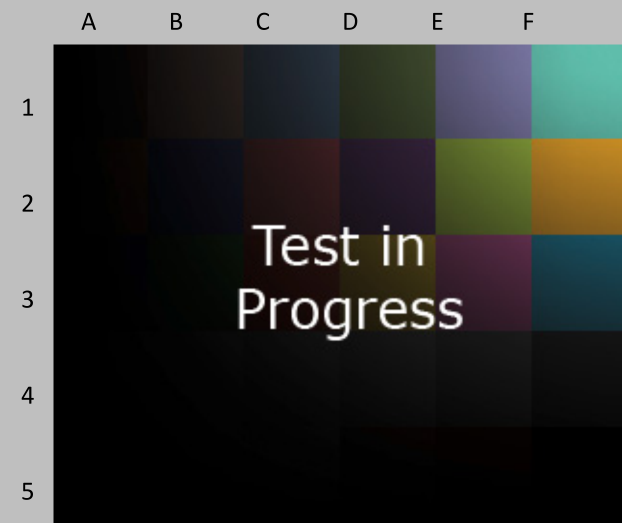
Summary Results	I* Color	I* tone	ΔE
Average Score for all patches	84.1	97.3	2.0
Worst 10% (3 lowest scoring patches)	53.9	93.7	4.9

100 Megalux hours

The 120 Megalux hour Update will be posted on approximately JAN 05, 2015.



Original Print Colors before light exposure



Colors After light exposure

Patch #	Description	I* Color	ΔE	L* Before	L* After	a* Before	a* After	b* Before	b* After
A1	Media White			96.1		1.4		-3.3	
B1	Highlight L* = 96			92.9		1.8		0.7	
C1	Highlight L* = 89			85.5		3.0		3.7	
D1	Highlight L* = 78			75.0		4.3		6.6	
E1	Midtone L* = 66			63.2		5.2		7.4	
F1	Midtone L* = 52			49.4		5.9		6.8	
A1	Highlight L* = 92			88.9		2.7		2.7	
B2	Highlight L* = 85			82.2		3.5		5.2	
C2	Highlight L* = 75			72.1		4.6		6.7	
D2	Midtone L* = 63			60.6		5.4		7.6	
E2	Midtone L* = 50			48.4		5.9		7.1	
F2	Midtone L* = 38			36.8		6.5		6.4	
A3	Highlight L* = 82			79.3		3.9		6.6	
B3	Midtone L* = 72			69.9		4.8		7.9	
C3	Midtone L* = 60			58.0		5.5		7.6	
D3	Midtone L* = 47			45.7		6.1		7.1	
E3	Midtone L* = 35			34.6		6.6		6.8	
F3	Shadow L* = 25			26.8		6.9		6.2	
A4	Midtone L* = 69			66.5		5.0		7.5	
B4	Midtone L* = 57			54.8		5.7		7.6	
C4	Midtone L* = 44			43.0		6.3		7.2	
D4	Midtone L* = 32			32.5		6.7		6.5	
E4	Shadow L* = 20			22.6		7.2		5.6	
F4	Shadow L* = 10			14.7		7.0		4.6	
A5	Midtone L* = 55			52.6		5.8		7.3	
B5	Midtone L* = 41			40.0		6.4		7.0	
C5	Midtone L* = 29			29.9		6.8		6.5	
D5	Shadow L* = 15			19.8		6.9		5.8	
E5	Shadow L* = 5			12.5		6.3		4.1	
F5	Max Black			6.7		3.5		2.4	

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

120 Megalux hours