

# LUTs

This is simple procedure that in couple minutes for any named color stored in Color Library or Palette reduces  $\Delta E$  error to minimal value. It can work with both RGB or CMYK ICC Profiles. Corrections are unique for each individual sample in the Library.

Thank to this easy to use solution Reports, Snowflakes, Grids and Fanbooks can be printed with average error of 0.5  $\Delta E$ .

In advance to use this tool we recommend creating custom device ICC profile. Be sure to save all printing properties and use same type of substrate. In some situations you may need to repeat procedure couple times but for properly managed printers 2-3 steps is enough. Be sure that your print is uniform enough and never expect accuracy higher than measured variations (step number one in the procedure).

# LUTs – create/edit

1. Create a series of averaged measurements to define Reference

The screenshot displays the ChromaChecker software interface for a color measurement session. The top navigation bar includes a 'Scratchpad' icon, the 'QuickChecker' title, and various tool icons. Below this, a control bar contains buttons for 'Substrate', 'Start Color Match', 'Stop Variation', 'Recalibrate', and 'Measure'. The main interface is divided into several sections:

- Color Specification:** M0 / D50 / 2° / White
- Source of Reference:** Assets
- Printing Device:** -
- Customer:** -
- Sample Name:** Variation #149

The central area displays the following data and graphs:

- Variation #149:** 2024-01-25 19:55:31
- Spectral Reflectance Graph:** A line graph showing reflectance values from 0 to 1.2 across a color spectrum from purple to red.
- Statistics:**
  - Samples: 6
  - # Pairs: 15
  - Max.  $\pm 0.18$
  - 95%  $\pm 0.17$
  - Average  $\pm 0.11$
- E-Factor:** 0.17
- CRF:** A color reference field showing a uniform purple color.
- CIE Lab  $a^* / b^*$  plot:** A scatter plot with axes ranging from 18.00 to 20.00. The plot shows several data points clustered around a central value.
- Uniformity:** A vertical color bar on the right side of the CIE Lab plot, ranging from 50.25 to 52.50. Text below it reads: 'Measure 9 or 25 samples to get uniformity report.'

At the bottom, there is a 'Library / Palette' dropdown menu.

# LUTs – create/edit

## 2. Rename and save to Assets (use existing on create a new Palette)

The screenshot displays the ChromaChecker software interface. At the top, the 'QuickChecker' header is visible. Below it, a toolbar contains buttons for 'Substrate', 'Start Color Match', 'Start Variation', 'Recalibrate', and 'Measure'. The main workspace shows a color specification for 'PMS Mascara Panoramic' with a source of reference set to 'Assets'. A blue banner at the bottom of the workspace contains the 'Export to assets' section, which includes a dropdown for 'Library / Palette' (set to 'New Palette'), a text field for 'Sample Name' (set to 'PMS Mascara Panoramic'), and a 'Save' button. Below this banner, three graphs are displayed: a 'Spectral Reflectance Graph' showing a curve from 0 to 1.2, a 'CIE Lab' graph showing a color space with axes for a\*, b\*, and L\*, and a 'Uniformity' graph showing a color bar. A statistics panel on the left provides data for the color: Samples: 6, # Pairs: 15, Max.  $\pm 0.18$ , 95%  $\pm 0.17$ , Average  $\pm 0.11$ , and an E-Factor of 0.17. A CRF graph is also visible.

# LUTs – create/edit

3. Start Color Match - select printer profile, then hit Print PDF button

The screenshot displays the ChromaChecker QuickChecker software interface. The top navigation bar includes a 'Scratchpad' icon, the 'QuickChecker' title, and several utility icons. Below the navigation bar, there are control buttons: 'Substrate', 'Stop Color Match', 'Start Variation', 'Recalibrate', and 'Measure'. The main configuration area is divided into several sections:

- Color Specification:** M0 / D50 / 2° / White
- Source of Reference:** Assets
- Printing Device:** -
- Customer:** [Empty field]

The **Color Match** section (Beta Version) contains the following settings:

- Media Size:** A4 (210mm x 297mm)
- PDF Color Space:** CMYK
- Correction Factor:** 0,9
- Device ICC profile:** Epson 4900 M0 SPOT v2
- Color Depth:** 16 bit

A **Print PDF** button is located in the top right corner of the Color Match section.

Below the configuration area, there is a **Color Match tool** section with the following text:

Please select Reference and setup Color Space. In next step, please Print PDF and measure reference sample with Your instrument. Color Match tool will report measured color and generate corrected PDF for next iteration, Please keep repeating this procedure few times to achive best result.

The bottom section shows the **Library / Palette** and **Sample** dropdowns, both set to 'Panoramic' and 'PMS Mascara Panoramic' respectively. Below this, a color swatch for 'PMS Mascara Panoramic' is shown, along with its **Reference** color data:

Reference	
<b>L*</b>	51.40
<b>a*</b>	50.93
<b>b*</b>	18.97
<b>C</b>	54.35
<b>h</b>	20.42



# LUTs – create/edit

4. Measure Printed sample, then hit Print PDF button again

The screenshot displays the ChromaChecker software interface. The top navigation bar includes 'Scratchpad', 'QuickChecker', and various tool icons. The main workspace is divided into several sections:

- Color Match Section:** Contains settings for Media Size (A4), PDF Color Space (CMYK), Correction Factor (0.9), Device ICC profile (Epson 4900 M0 SPOT v2), and Color Depth (16 bit). A 'Print PDF' button is visible on the right.
- Spectral Reflectance Graph:** Shows a line graph of reflectance vs. wavelength, with a value of 0.59 at 730nm.
- CIE Lab Section:** Displays colorimetric data: L\* = 51.90, a\* = 51.54, b\* = 14.91, C = 53.66, h = 16.1°. It also includes OBA Index (0.3) and FI (0.2).
- ICC Section:** Shows CMYK values (C=5.49, M=79.22, Y=42.75, K=5.49) and RGB values (R=181, G=82, B=100). It also displays sRGB HEX #CF5165.
- Library / Palette Section:** Shows the selected sample 'PMS Mascara Panoramic'.
- Colorimetry Table:** A table comparing the sample's colorimetry to a reference.

	Density	Colorimetry	Deltas	Metamerism
	Sample	Reference	$\Delta$	
L*	51.90	51.40	0.50	
a*	51.54	50.93	0.61	
b*	14.91	18.97	-4.06	
C	53.66	54.35	-0.7	

# LUTs – create/edit

5. Measure second print, if  $\Delta E$  is too big print again or if ok - select LUT and hit "Update LUT".

The screenshot displays the ChromaChecker software interface. The top navigation bar includes 'Scratchpad', 'QuickChecker', and various tool icons. The main workspace is divided into several sections:

- Color Match Section:** Includes dropdowns for 'Color Specification' (M0 / D50 / 2° / White), 'Source of Reference' (Assets), 'Printing Device' (-), 'Customer' (empty), and 'Sample Name' (Rose #150). It also features buttons for 'Substrate', 'Stop Color Match', 'Start Variation', 'Recalibrate', and 'Measure'.
- Media and Color Space Settings:** 'Media Size' is set to A4 (210mm x 297mm), 'PDF Color Space' to CMYK, 'Correction Factor' to 0.9, 'Device ICC profile' to Epson 4900 M0 SPOT v2, and 'Color Depth' to 16 bit. A 'Print PDF' button is present.
- Spectral Reflectance Graph:** Shows a graph with a y-axis from 0 to 1.2 and an x-axis from 0 to 70. A green curve represents the sample's reflectance, and a black curve represents the reference. The value at 730nm is 0.59.
- CIE Lab Color Space:** Displays L\* = 51.90, a\* = 51.54, b\* = 14.91, C = 53.66, and h = 16.1°. It also shows OBA Index (0.3) and FI (0.2).
- ICC Profile:** Shows the selected profile 'CMYK' (ISOcoated\_v2\_300\_eci) and its corresponding RGB values: R = 181, G = 82, B = 100. The sRGB HEX value is #CF5165.
- Library / Palette:** Shows 'Panoramic' as the library and 'PMS Mascara Panoramic' as the sample.
- Colorimetry Table:** A table comparing the sample and reference values for L\*, a\*, b\*, and C.

	Density	Colorimetry	Deltas	Metamerism
	Sample	Reference	$\Delta$	
L*	51.90	51.40	0.50	
a*	51.54	50.93	0.61	
b*	14.91	18.97	-4.06	
C	53.66	54.35	-0.7	

The  $\Delta E_{00}$  value is displayed as 2.3.

# LUTs – create/edit

6. System will close procedure and save standard to Scratchpad.

The screenshot displays the ChromaChecker software interface. The top navigation bar includes 'Scratchpad', 'QuickChecker', and various tool icons. Below the navigation bar, there are buttons for 'Substrate', 'Start Color Match', 'Start Variation', 'Recalibrate', and 'Measure'. The main workspace shows the following data:

**Color Specification:** M0 / D50 / 2° / White  
**Source of Reference:** None  
**Printing Device:** -  
**Customer:** -

**Color Name:** PMS Mascara Panoramic  
**Date/Time:** 2024-01-25 20:22:26

**Spectral Reflectance Graph:** A line graph showing reflectance from 0 to 1.2 on the y-axis and wavelength from 0 to 730nm on the x-axis. A value of 0.87 is noted at 730nm.

**CIE Lab:**  
L\* = 51.40  
a\* = 50.93  
b\* = 18.97  
C = 54.35  
h = 20.4°  
OBA Index: 2.1  
FI: 1.2

**a\* / b\* Chromaticity Diagram:** A diagram showing the color's position in the a\* / b\* plane, with a white circle indicating the target or reference point.

**Color Conversion Data:**

ICC	CII	Fluo	Designer
CMYK		RGB	
ISOcoated_v2_300_eci		Adobe RGB	
C = 5.49		R = 180	
M = 79.22		G = 81	
Y = 49.80		B = 93	
K = 6.27		( $\Delta E_{00} = 0.36$ )	
( $\Delta E_{00} = 0.02$ )		sRGB HEX	
		#CE505D	

**Bottom Message:** No source of reference selected. Select one from top bar to see comparison report.

# LUTs – create/edit

## 7. Print Report using just created correction stored in LUT

The screenshot displays the ChromaChecker software interface. The top navigation bar includes a 'Scratchpad' icon, a 'QuickChecker' title, and several utility icons. Below the navigation bar, there are buttons for 'Substrate', 'Start Color Match', 'Start Variation', 'Recalibrate', and 'Measure'. The main content area is divided into several sections:

- Color Specification:** M0 / D50 / 2° / White
- Source of Reference:** None
- Printing Device:** -
- Customer:** -

The target is identified as 'PMS Mascara Panoramic' with a timestamp of '2024-01-25 20:22:26'. A secondary navigation bar contains icons for 'Report', 'CxF', 'Assets', 'Grid', 'Variator', and 'Snowflake'. The 'PDF Report' section is highlighted in blue and contains the following settings:

- Media Size:** A4 (210mm x 297mm)
- PDF Color Space:** CMYK
- Device ICC profile:** Epson 4900 M0 SPOT v2
- LUT:** Color Match LUT 2024-01-25
- Color Depth:** 16 bit

A 'Download' button is located in the top right corner of the PDF Report section. Below this, the 'Spectral Reflectance Graph' shows a curve with a value of 0.87 at 730nm. The 'CIELab' section displays the following values:

- L\* = 51.40
- a\* = 50.93
- b\* = 18.97
- C = 54.35
- h = 20.4°
- OBA Index = 2.1
- FI = 1.2

The 'a\* / b\*' section shows a color space diagram with a white circle. The 'L\*' section shows a grayscale bar. The 'ICC' section displays the following data:

ICC	CII	Fluo	Designer
CMYK		RGB	
ISOcoated_v2_300_eci		Adobe RGB	
C = 5.49		R = 180	
M = 79.22		G = 81	
Y = 49.80		B = 93	
K = 6.27		( $\Delta E_{90} = 0.36$ )	
( $\Delta E_{90} = 0.02$ )		sRGB HEX	
		#CE505D	

A message at the bottom of the interface states: 'No source of reference selected. Select one from top bar to see comparison report.'

# LUTs – create/edit

... or any other PDF-based test form for example Snowflake.

The screenshot displays the ChromaChecker software interface. The top navigation bar includes 'Scratchpad', 'QuickChecker', and various tool icons. The main workspace is titled 'Snowflake' and contains the following configuration options:

- Color Specification: M0 / D50 / 2° / White
- Source of Reference: None
- Printing Device: -
- Customer: -
- PDF Color Space: CMYK
- Device ICC profile: Epson 4900 M0 SPOT v2
- LUT: Color Match LUT 2024-01-25
- Color Depth: 16 bit
- Snowflake distribution: Fine (selected), Medium, Coarse, Custom
- Show  $\Delta E_{00}$ :
- Target Comparison:

On the right side of the 'Snowflake' section, there are icons for Report, CxF, Assets, Grid, Variator, and Snowflake, along with a Download button.

The results section is divided into three panels:

- Spectral Reflectance Graph:** A line graph showing reflectance from 0 to 1.2 across a wavelength range. A value of 0.87 is noted at 730nm.
- CIE Lab:** A color wheel with a central point and a vertical L\* scale. Values: L\* = 51.40, a\* = 50.93, b\* = 18.97, C = 54.35, h = 20.4°. OBA Index is 2.1 and FI is 1.2.
- ICC:** A table comparing CMYK and RGB color spaces.

ICC	CII	Fluo	Designer
CMYK		RGB	
ISOcoated_v2_300_eci		Adobe RGB	
C = 5.49		R = 180	
M = 79.22		G = 81	
Y = 49.80		B = 93	
K = 6.27		( $\Delta E_{00} = 0.36$ )	
( $\Delta E_{00} = 0.02$ )		sRGB HEX	
		#CE505D	

At the bottom of the interface, a message states: "No source of reference selected. Select one from top bar to see comparison report."

# LUTs – create/edit

Set your Reference and check quality of prints.

The screenshot displays the ChromaChecker software interface. The top navigation bar includes 'Scratchpad', 'QuickChecker', and various tool icons. The main workspace is divided into several sections:

- Color Specification:** M0 / D50 / 2° / White, Source of Reference: Scratchpad, Printing Device: -, Customer: , Sample Name: Rose #154.
- Color Specification Summary:** Rose #154, 2024-01-25 20:37:33.
- Spectral Reflectance Graph:** A line graph showing reflectance vs. wavelength (0.59 @ 730nm).
- CIE Lab:** L\* = 51.52, a\* = 51.23, b\* = 19.18, C = 54.70, h = 20.5°. OBA Index: 0.3, FI: 0.2.
- Colorimetry:** ICC: CMYK (ISOcoated\_v2\_300\_eci), RGB: Adobe RGB. Values: C = 5.49, M = 79.61, Y = 50.20, K = 5.88 (ΔE<sub>00</sub> = 0.02); R = 181, G = 81, B = 93 (ΔE<sub>00</sub> = 0.31). sRGB HEX: #CF505D.
- QC Measurements:** PMS Mascara Panoramic.
- QC Results:** ΔE<sub>00</sub> 0.2.
- Colorimetry Table:**

	Density	Colorimetry	Deltas	Metamerism
	Sample	Reference	Δ	
L*	51.52	51.40	0.12	
a*	51.23	50.93	0.30	
b*	19.18	18.97	0.21	
C	54.70	54.35	0.4	
h	20.53	20.42	0.1	

# LUTs — create/edit

## 1st printed PDF

**PMS Mascara Panoramic**

 ChromaChecker



Color Specification: M0 / D50 / 2°  
Instrument: X-Rite i1 Pro 2 sn. 1058382

Operator: Piotr Pyk

Color Space: CMYK  
ICC: Epson 4900 M0 SPOT v2

Reference

**L = 51.40**  
**a = 50.93**  
**b = 18.97**

C = 7.36  
M = 77.31  
Y = 34.25  
K = 11.36

roundtrip  $\Delta E = 0.0$

## 2nd printed PDF

**PMS Mascara Panoramic**

 ChromaChecker



Color Specification: M0 / D50 / 2°  
Instrument: X-Rite i1 Pro 2 sn. 1058382

Operator: Piotr Pyk  
Created: 2024-01-25 20:08:08

Color Space: CMYK  
ICC: Epson 4900 M0 SPOT v2

Reference

**L = 51.40**  
**a = 50.93**  
**b = 18.97**

C = 7.36  
M = 77.31  
Y = 34.25  
K = 11.36

roundtrip  $\Delta E = 0.0$

Corrected

**L = 50.95**  
**a = 50.38**  
**b = 22.62**

C = 7.62  
M = 77.57  
Y = 38.19  
K = 11.65

roundtrip  $\Delta E = 0.1$

# LUTs — create/edit

## Snowflake

### PMS Mascara Panoramic

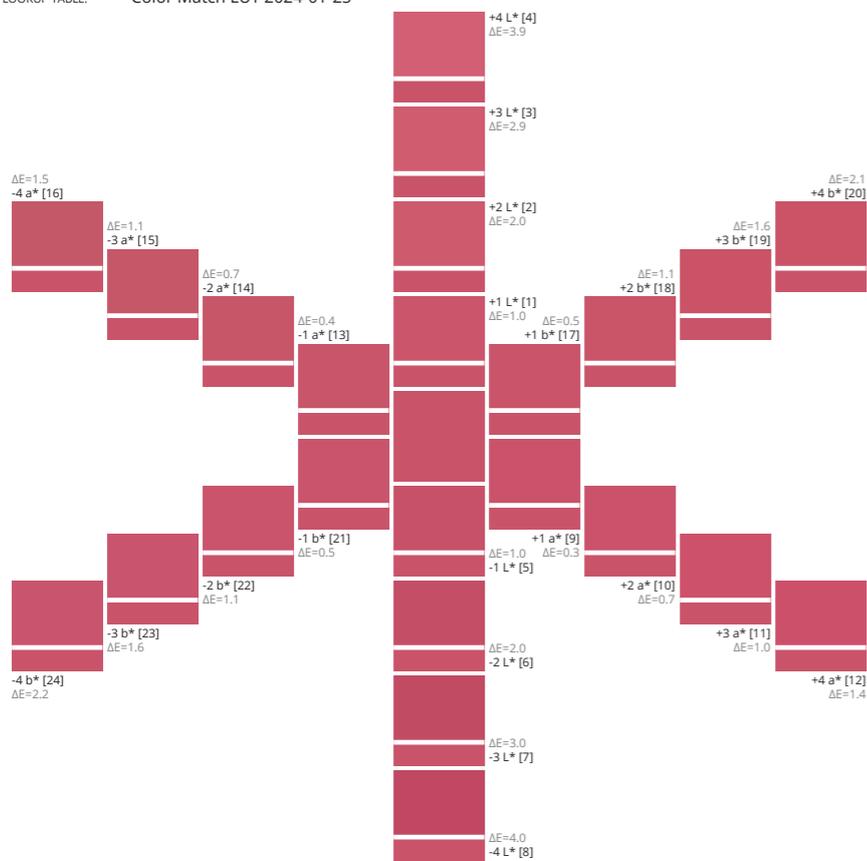
L\* = 51.3999, a\* = 50.9285, b\* = 18.9652

COLOR LIBRARY / PALETTE: QuickChecker

COLOR SPACE: 16 bit CMYK, Epson 4900 M0 SPOT v2

COLOR SPECIFICATION: M0, D50/2°

LOOKUP TABLE: Color Match LUT 2024-01-25



### SPOT COLOR TOLERANCE

L*	a*	b*	
			High Tolerance
			Low Tolerance

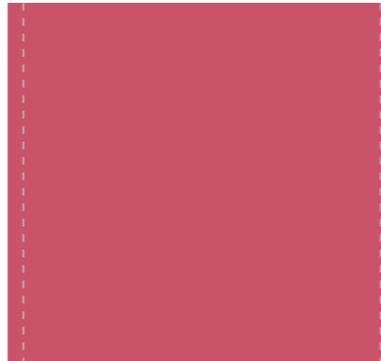
ChromaChecker

created: 2024-01-25, 19:25

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## Fanbook page

Panoramic



### PMS Mascara Panoramic

CIE Lab D50/2°

L: **51.40** C: **54.35**  
a: **50.93** h: **20.43°**  
b: **18.97**

CMYK  
Epson 4900 M0 SPOT v2 · M0

C: **7.36**  
M: **77.31**  
Y: **34.25**  
K: **11.36**

ΔE 0.05

RGB (AdobeRGB1998)

R: **45603** #B223507C5D7E  
G: **20604**  
B: **23934**

ΔE 0.00

RAL Design

**20 51 54**

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# LUTs — create/edit

## **LFP & Digital**

You can use same procedure to match any spot color already printed on another device. The only critical condition it has to be in the gamut and ICC Profile has to describe print condition.

## **Designers**

Creating RGB profile for your desktop color printer you may print color samples with unexpected accuracy. Start from learning how to use Photoshop to print Proofs.

## **QC Controllers**

You may proof very small color differences and print extremely accurate Reports for Customers.

