impression FR1
Photometric Report

Report 2021-04-12-2

GLP German Light Products GmbH
GLP LightLab

Maximum Total Lumens	790	lm
Maximum Intensity	105000	cd
CRI	73	
Energy Efficiency Class	D	
Energy Efficiency Index	1.30	
Power Consumption	83	$\frac{\text{kW h}}{\text{1000 h}}$

Measurement Date	2021-04-12 16:43
Analysis Date	2021-07-14 11:26
Analysis SW Version	2.4.1

Contents

1 Light Distribution

Table 1: Summary of beam opening angles for different fixture configurations.

Beam	Beam Angle (50 %) C0	C90	Field Angle (10 %) C0	C90	Cutoff Angle (3 %) C0	C90
Wide, RGBW	24°	23°	36°	36°	39°	39°
Medium, RGBW	11°	11°	18°	18°	20°	20°
Narrow, RGBW	4.6°	4.5°	7.1°	6.9°	8.5°	8.1°

Table 2: Summary of luminous flux and intensity for different fixture configurations.

Beam	Total Lumen Output	Peak Luminous Intensity)
Wide, RGBW	790 lm	5.16 kcd
Medium, RGBW	722 lm	20.2 kcd
Narrow, RGBW	605 lm	105 kcd

Table 3: Approximate illuminance and beam diameter at different projection distances, calculated with the inverse-square law. The approximation is valid only for large distances, compared to the size of the fixture output port.

			Projection Distance [m]								
Beam	Parameter	Factor	5	7.5	10	12.5	15	17.5	20	22.5	25
Wide, RGBW	Diameter [m]	0.83	4.2	6.2	8.3	10	12	15	17	19	21
	Illuminance [lx]	4.14k	170	74	41	26	18	14	10	8.2	6.6
Medium, RGBW	Diameter [m]	0.40	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
	Illuminance [lx]	17.9k	720	320	180	110	80	59	45	35	29
Narrow, RGBW	Diameter [m]	0.16	0.79	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0
	Illuminance [lx]	95.2k	3.8k	1.7k	950	610	420	310	240	190	150

1.1 Wide, RGBW Beam

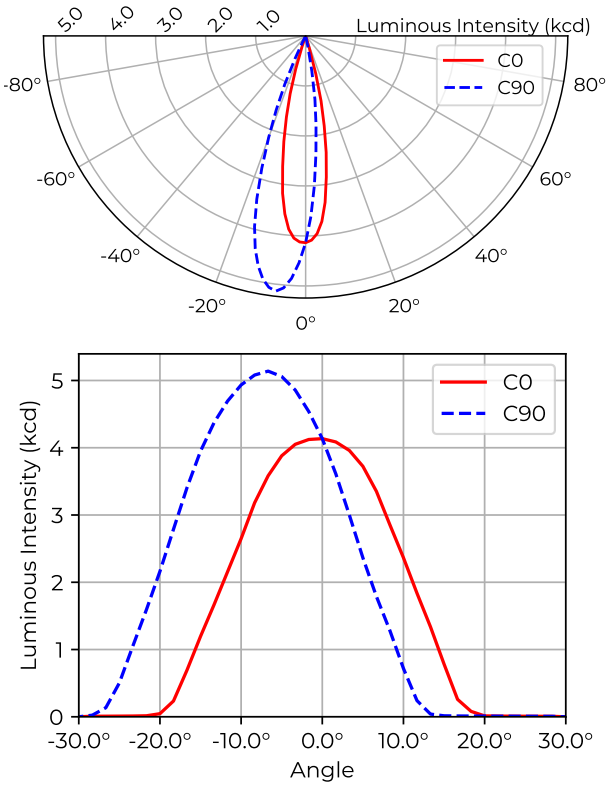


Figure 1: Polar and cartesian light intensity distributions. Wide, RGBW

Type B measurement, 1296 data points.

Table 4: Opening angles for different intensity thresholds. Wide, RGBW

		C0	C90
Beam Angle	50 %	24°	23°
Field Angle	10 %	36°	36°
Cutoff Angle	3 %	39°	39°

Table 5: Luminous flux, integrated over the beam for several minimum threshold intensities. Wide, RGBW

		Flux (lm)
Half-Peak Output	@50 %	520
Tenth-Peak Output	@10 %	774
Total Lumen Output	@3 %	790

$$\text{diameter} = 0.83 \times \text{distance}$$

$$\text{illuminance} = \frac{4140\,\text{lx}}{(\text{distance}\,[\text{m}])^2}$$

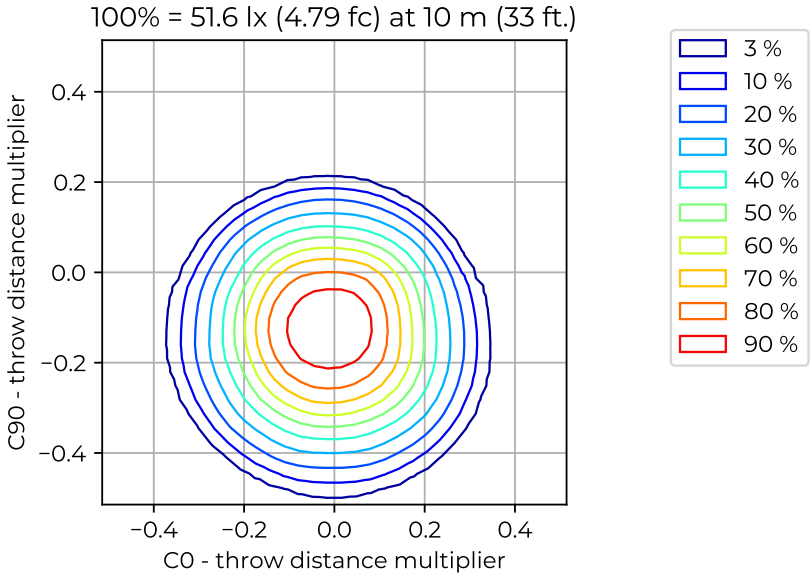


Figure 2: Iso-illuminance diagram of projected beam. Wide, RGBW
dist. from origin = throw dist. × throw dist. multiplier

Table 6: Quick calculation diagram for illuminance and beam diameter. Wide, RGBW

		Projection Distance [m]								
Parameter	Factor	5	7.5	10	12.5	15	17.5	20	22.5	25
Diameter [m]	0.83	4.2	6.2	8.3	10	12	15	17	19	21
Illuminance [lx]	4.14k	170	74	41	26	18	14	10	8.2	6.6

1.2 Medium, RGBW Beam

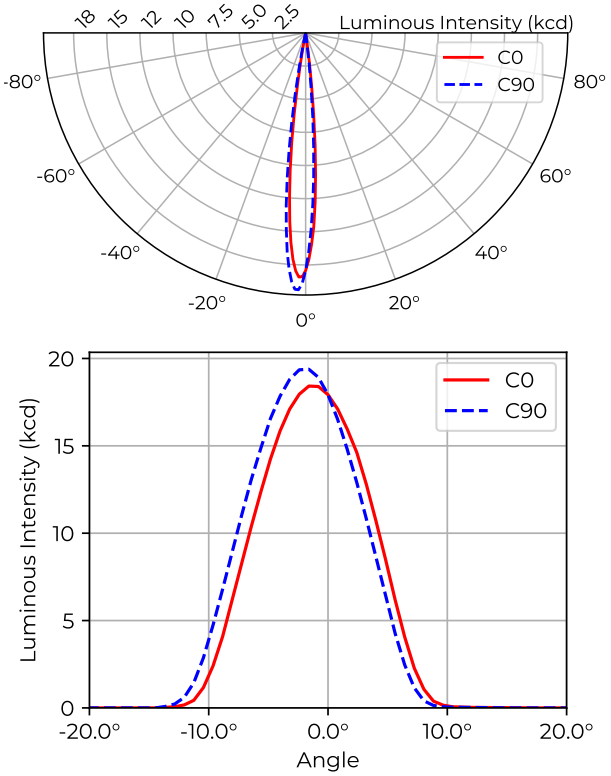


Figure 3: Polar and cartesian light intensity distributions. Medium, RGBW

Type B measurement, 1296 data points.

Table 7: Opening angles for different intensity thresholds. Medium, RGBW

		C0	C90
Beam Angle	50 %	11°	11°
Field Angle	10 %	18°	18°
Cutoff Angle	3 %	20°	20°

Table 8: Luminous flux, integrated over the beam for several minimum threshold intensities. Medium, RGBW

		Flux (lm)
Half-Peak Output	@50 %	458
Tenth-Peak Output	@10 %	698
Total Lumen Output	@3 %	722

$$\text{diameter} = 0.40 \times \text{distance}$$

$$\text{illuminance} = \frac{17\,900\ \text{lx}}{(\text{distance}\ [\text{m}])^2}$$

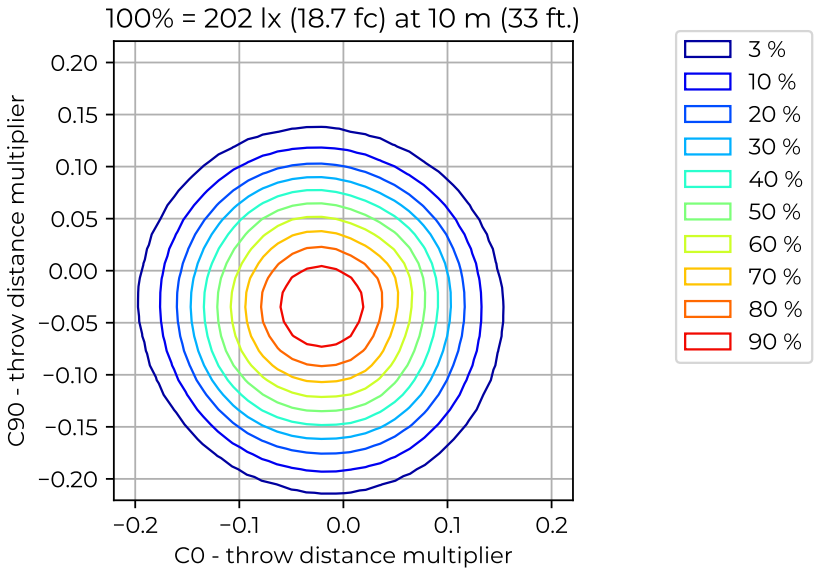


Figure 4: Iso-illuminance diagram of projected beam. Medium, RGBW
dist. from origin = throw dist. × throw dist. multiplier

Table 9: Quick calculation diagram for illuminance and beam diameter. Medium, RGBW

		Projection Distance [m]								
Parameter	Factor	5	7.5	10	12.5	15	17.5	20	22.5	25
Diameter [m]	0.40	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0
Illuminance [lx]	17.9k	720	320	180	110	80	59	45	35	29

1.3 Narrow, RGBW Beam

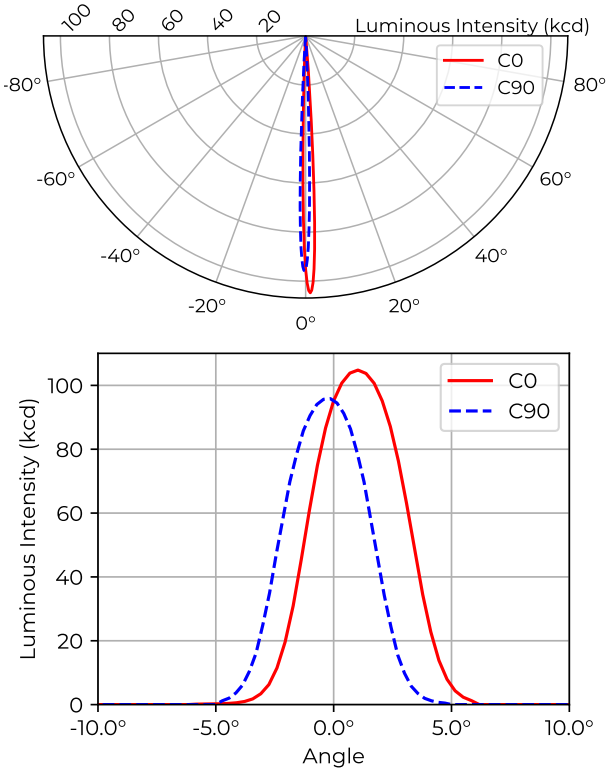


Figure 5: Polar and cartesian light intensity distributions. Narrow, RGBW

Type B measurement, 1296 data points.

Table 10: Opening angles for different intensity thresholds. Narrow, RGBW

		C0	C90
Beam Angle	50 %	4.6°	4.5°
Field Angle	10 %	7.1°	6.9°
Cutoff Angle	3 %	8.5°	8.1°

Table 11: Luminous flux, integrated over the beam for several minimum threshold intensities. Narrow, RGBW

		Flux (lm)
Half-Peak Output	@50 %	395
Tenth-Peak Output	@10 %	576
Total Lumen Output	@3 %	605

$$\text{diameter} = 0.16 \times \text{distance}$$

$$\text{illuminance} = \frac{95\,200\ \text{lx}}{(\text{distance}\ [\text{m}])^2}$$

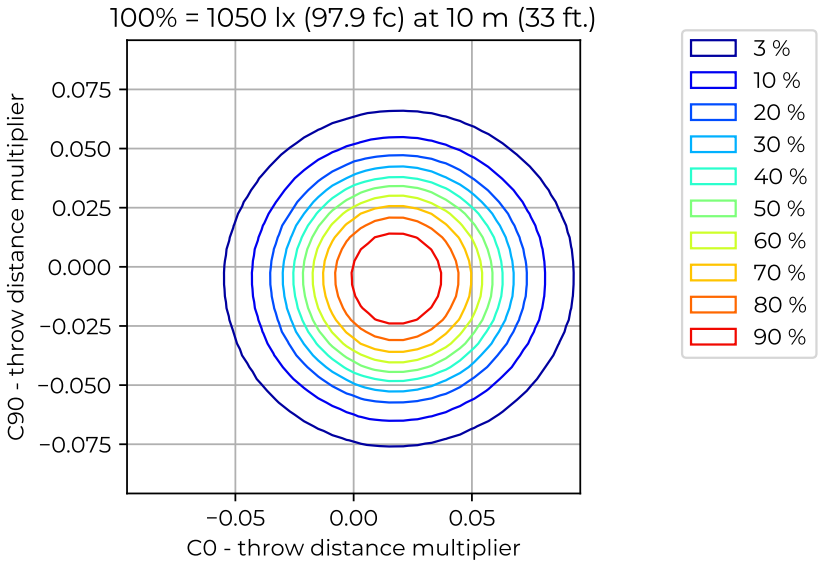


Figure 6: Iso-illuminance diagram of projected beam. Narrow, RGBW
dist. from origin = throw dist. × throw dist. multiplier

Table 12: Quick calculation diagram for illuminance and beam diameter. Narrow, RGBW

		Projection Distance [m]								
Parameter	Factor	5	7.5	10	12.5	15	17.5	20	22.5	25
Diameter [m]	0.16	0.79	1.2	1.6	2.0	2.4	2.8	3.2	3.6	4.0
Illuminance [lx]	95.2k	3.8k	1.7k	950	610	420	310	240	190	150

2 White Quality – White Chip

Table 13: Summary for White Chip spectral measurement results and color metrics.

Metric	Value
CCT	8154 K
CCT D_{uv}	-0.010
CRI R_a	73
CRI R_9	5.0
TLCI-2015	44
TM-30-15 R_f	97
TM-30-15 R_g	63
CIE 1931 x	0.298
CIE 1931 y	0.290
CIE 1960 u	0.203
CIE 1960 v	0.296

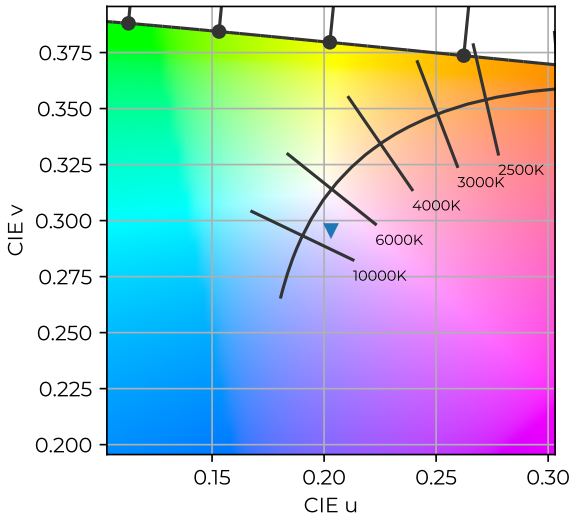


Figure 7: Color coordinates in CIE 1960 chromaticity diagram. White Chip

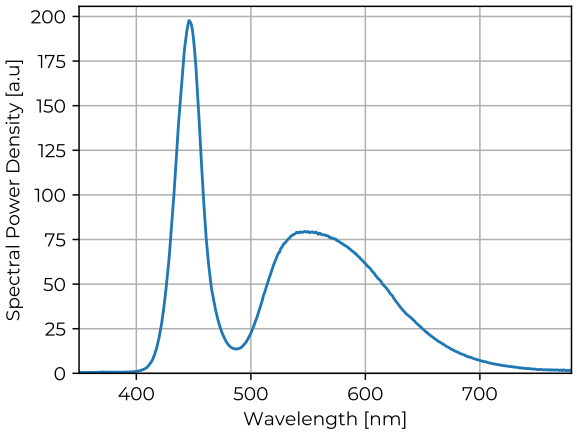
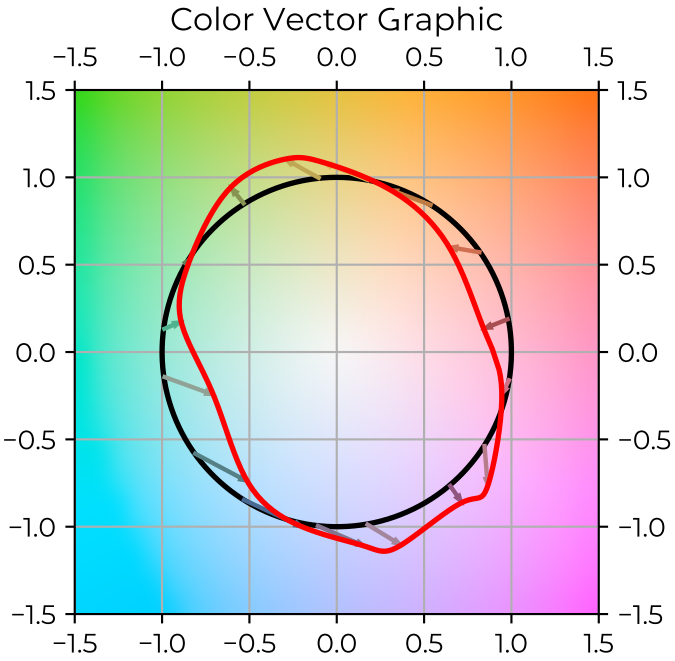
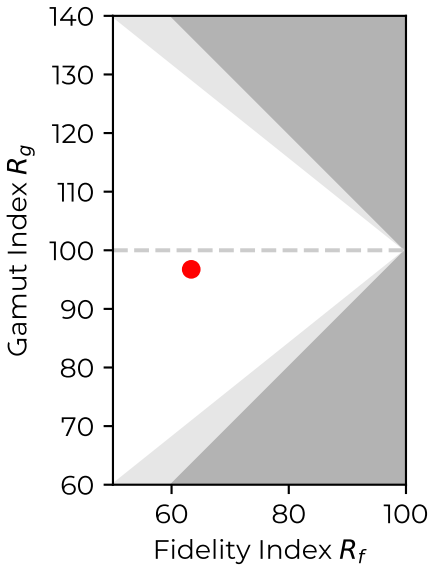
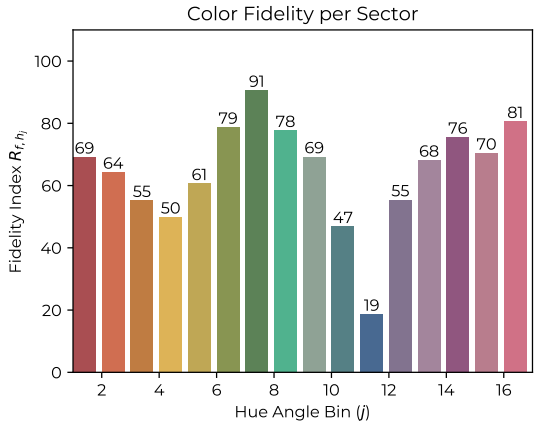


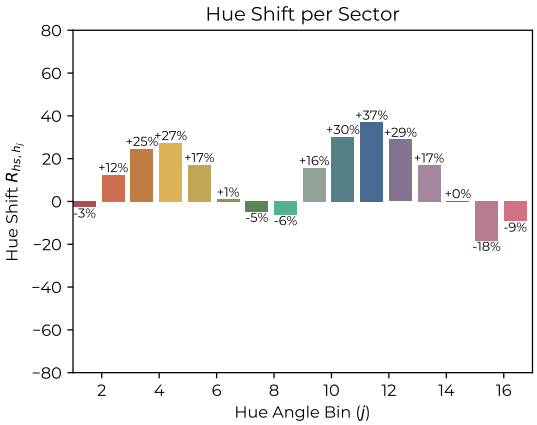
Figure 8: Measured Spectral Power Distribution of light source. White Chip

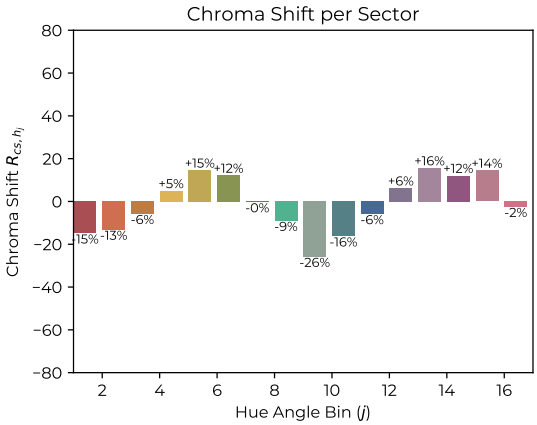
2.1 TM-30-15 Detail Plots

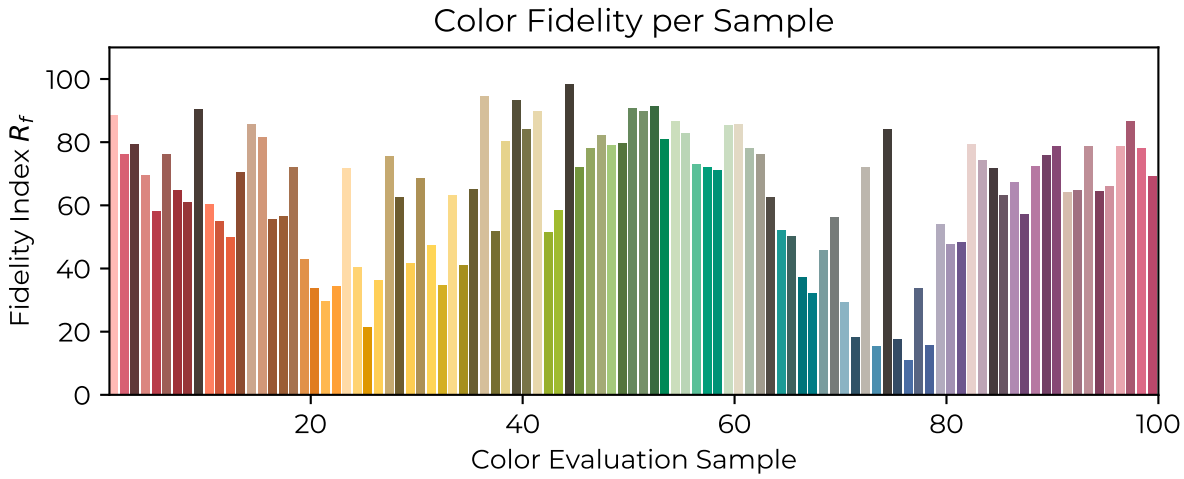






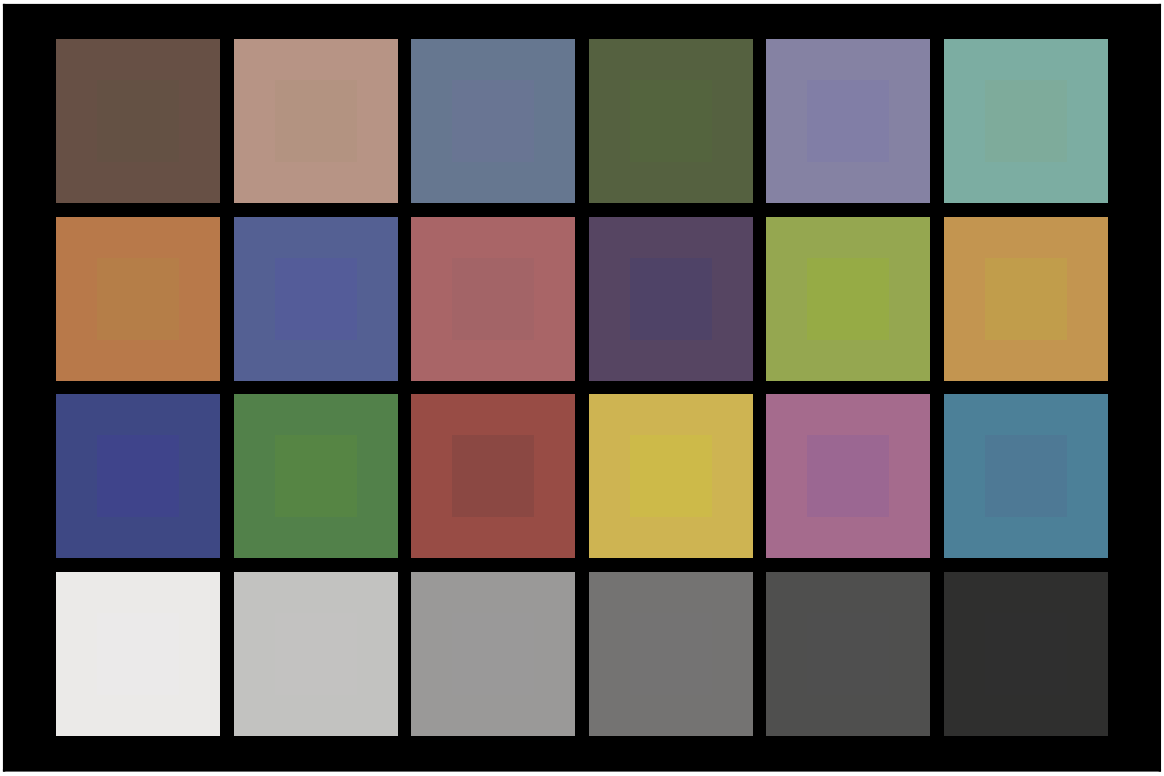


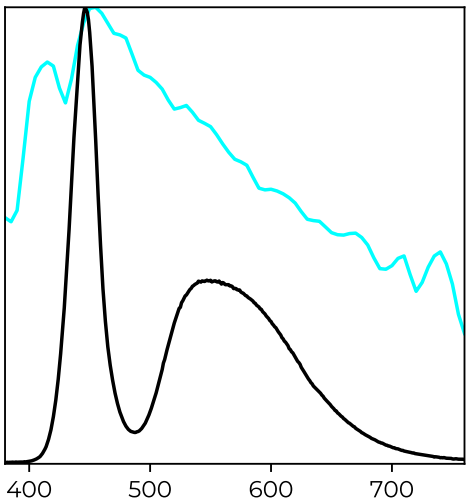



Color Fidelity per Sample
Fidelity Index R_f
100
80
60
40
20
0
20
40
60
80
100
Color Evaluation Sample

2.2 TLCI-2012 Results

impression FR1 White Chip : CCT = D8199 −2.5, TLCI = 44





Sector	Lightness	Chroma	Hue
R	5	5	5
R/Y	2	2	2
Y	5	5	5
Y/G	3	3	3
G	5	5	5
G/C	4	4	4
C	6	6	6
C/B	7	7	7
B	4	4	4
B/M	6	6	6
M	8	8	8
M/R	6	6	6

3 Colors

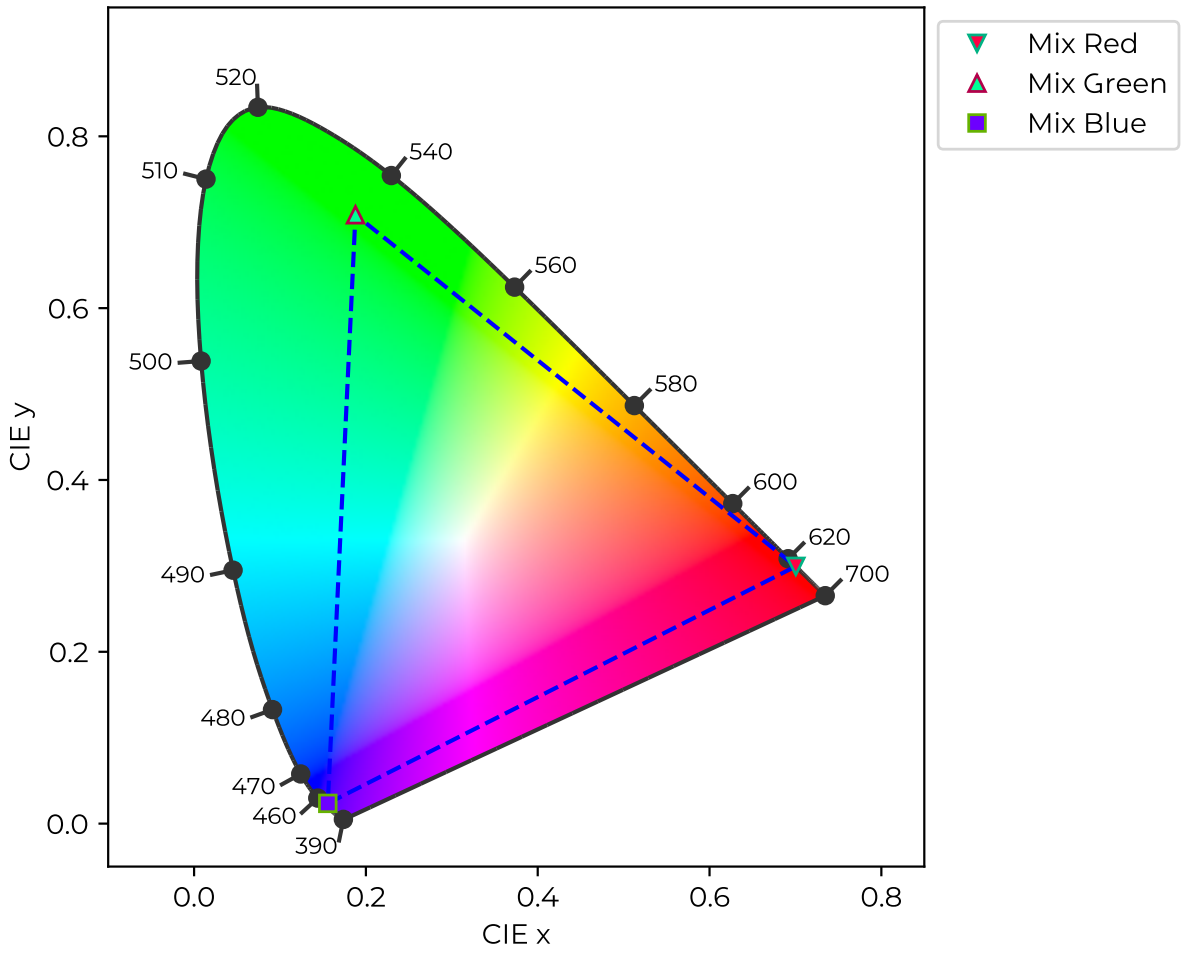


Figure 9: Chromaticity coordinates of device colors in a CIE 1931 chromaticity diagram. Gamut of color mixing system is outlined with dashed lines.

Table 14: Chromaticity coordinates for figure 9, in CIE 1931 xy and CIE 1960 UCS uv coordinates. Color swatches are illustrative only, limited by screen and print color space. Color appearance will be different when used for illumination.

Color	xy	uv
Mix Red	0.7, 0.299	0.54, 0.346
Mix Green	0.188, 0.709	0.0675, 0.382
Mix Blue	0.156, 0.0236	0.21, 0.0476