



FUZE PENDANT™

Photometric Test Report

50° Lens

89.9° Field Angle

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TESTING PROCESS

Introduction

Elation operates an optical testing laboratory at its Los Angeles, CA headquarters to provide accurate photometric data for its lighting products. The testing lab is both light and climate-controlled and contains a variety of precise lighting measurement systems. Fixtures are analyzed with the sophisticated [Viso Systems Lab Spion](#) equipment, which measures all light and color parameters by panning the light beam at a precise speed and from different angles through a calibrated, laser aligned light and color sensor. Test data is collected and summarized by the Viso Light Inspector software. This type of measurement system is referred to as a Goniophotometer.

The Viso software calculates all relevant types of measurements, from beam angles, candela to center light intensity at a variety of distances to the latest color quality measurements like TM30 or CQS as well as accurate color temperature. This wealth of data is then processed by an Elation specific template which is included in the photometric test report for various fixture conditions such as zoom angles and color correction filters.

The Viso software also creates IES (Illuminating Engineering Society) files for each test report. IES is an industry standard file format created for the easy electronic transfer of photometric test data, which is widely used by lighting manufacturers for photometric data distribution.

Additionally, fixtures are periodically rechecked for accuracy using various hand-held light meters including one or more of the devices listed below. This is done to ensure the test data contained in this report is as accurate as possible.

[Asenstek Lighting Passport](#)

[Konica Minolta T-10](#)

[Sekonic C700](#)

Total Lumen Measurements

Lumens are measured using a Viso Systems Lab Spion. As a goniophotometer, the Viso calculates the field lumens of the fixture by taking multiple measurements across the light beam.

Many lumens figures provided for entertainment lighting fixtures are only the 2π sphere values, some even emphasize the LED engine lumens. All Elation product photometric data is the actual light output from the fixture lens, never a theoretical value based on calculation or using the source lumens as the fixtures output. We advise to always compare total fixture lumens acquired with identical measurement systems when comparing lighting fixtures.

Total Lumen Output: 11550 lm

Color Temperature: 6212 K

CRI: 69.3

TLCI: 77

TM30: 73.6

CQS: 83.9

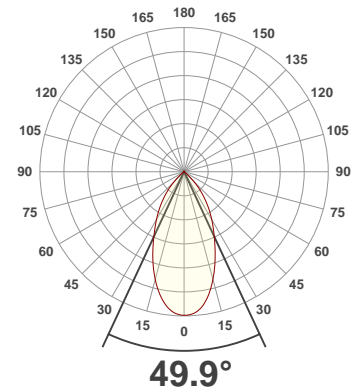
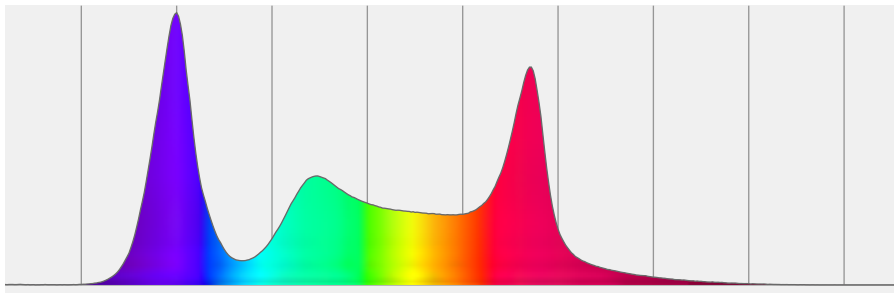
Measurement Date: 3/10/2020

Voltage: 112 V, Current: 2.37 A

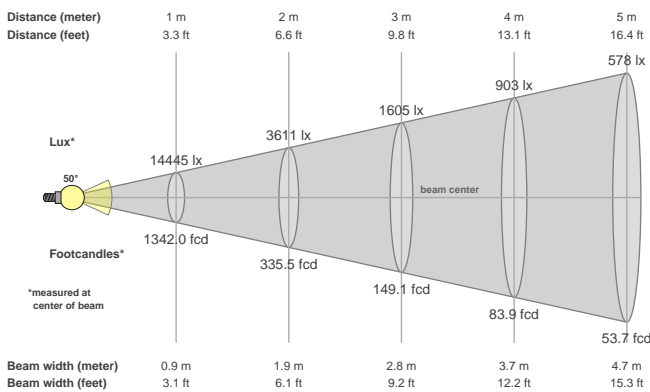
Power: 261.1 W

Efficacy: 44 Lumen/Watt

Spectral distribution
Dominant Wavelength 360



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.9°	89.8°	101.3°

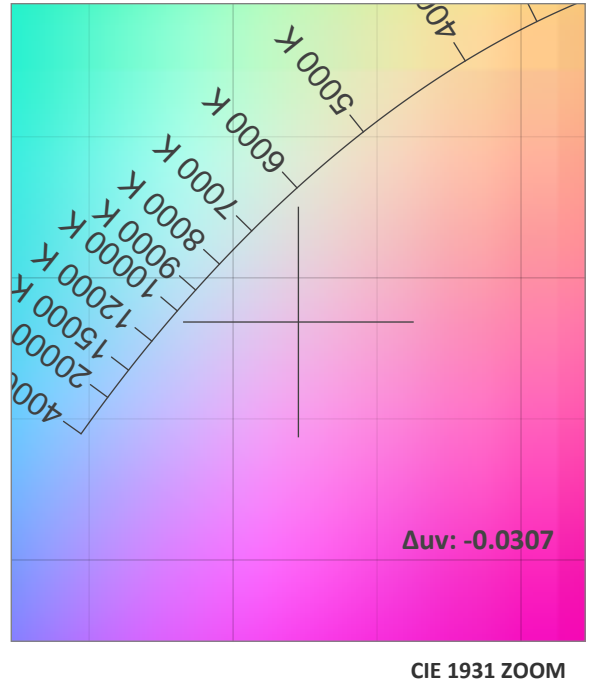
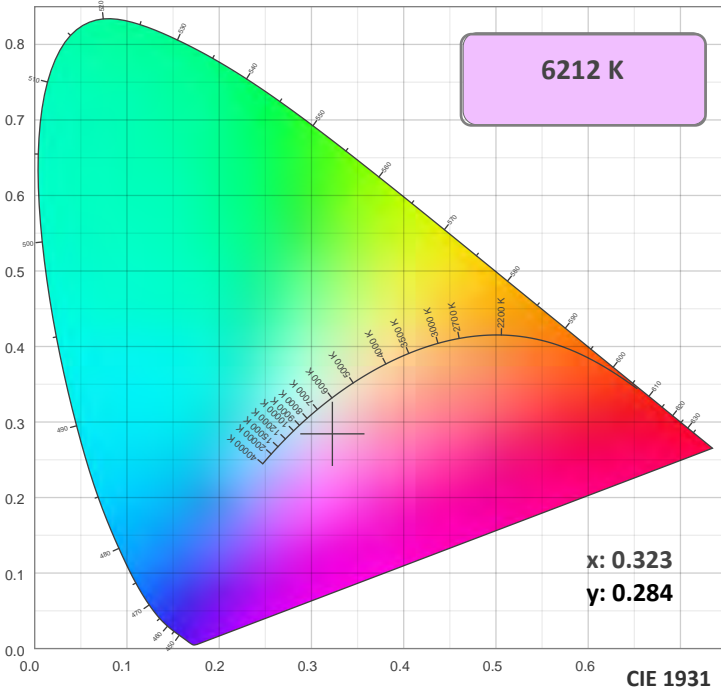
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
14446 cd	99.7%	95.8%

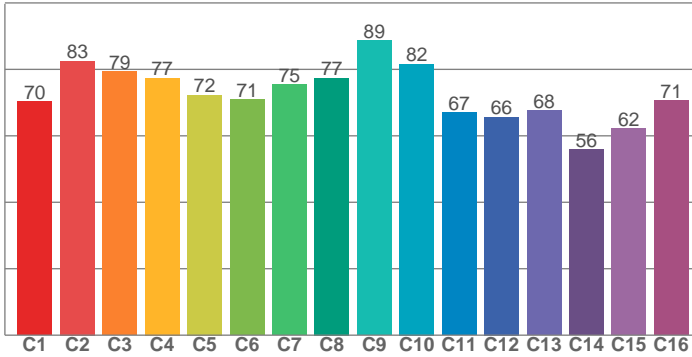
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	14445	3611	1605	903	578	401	295	226	178	144	119	100	85	74	64	56	50	45	40	36
FC	1342	335.5	149.1	83.9	53.7	37.3	27.4	21	16.6	13.4	11.1	9.3	7.9	6.8	6	5.2	4.6	4.1	3.7	3.4

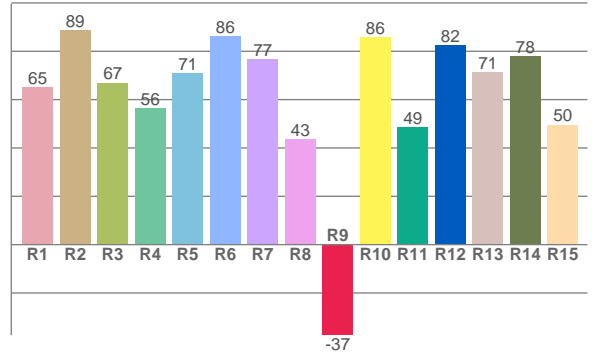
Color Details



TM30: 73.6



CRI: 69.3 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
65.0	88.8	66.9	56.4	71.0	86.2	76.6	43.5	-37.5	85.8	48.7	82.4	71.3	77.8	49.5

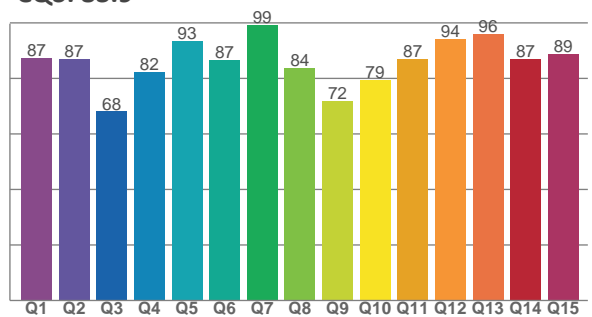
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
70.3	82.6	79.3	77.5	72.3	70.9	75.4	77.4	88.6	81.6	67.0	65.7	67.6	55.8	62.3	70.6

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
87.3	87.0	68.1	82.2	93.5	86.6	99.3	83.8	71.9	79.4	87.1	94.1	96.0	87.1	88.9

CQS: 83.9



Color Parameters

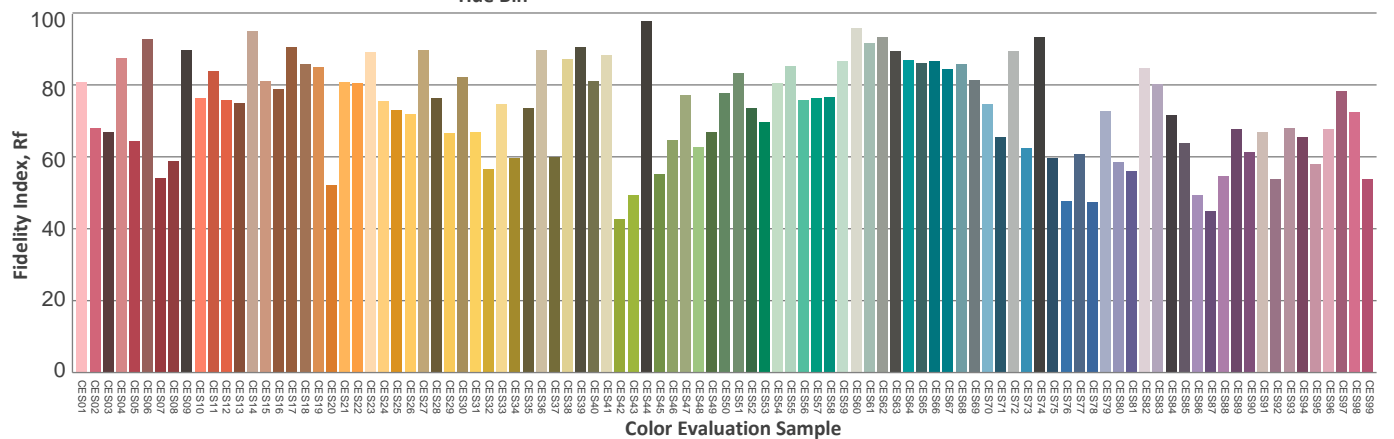
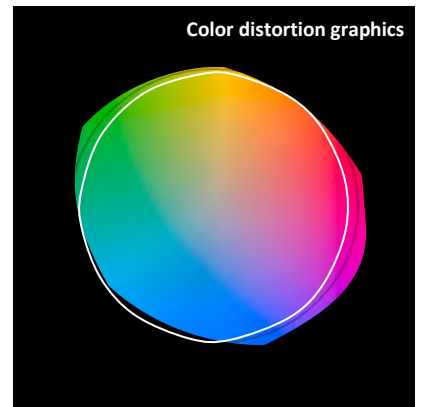
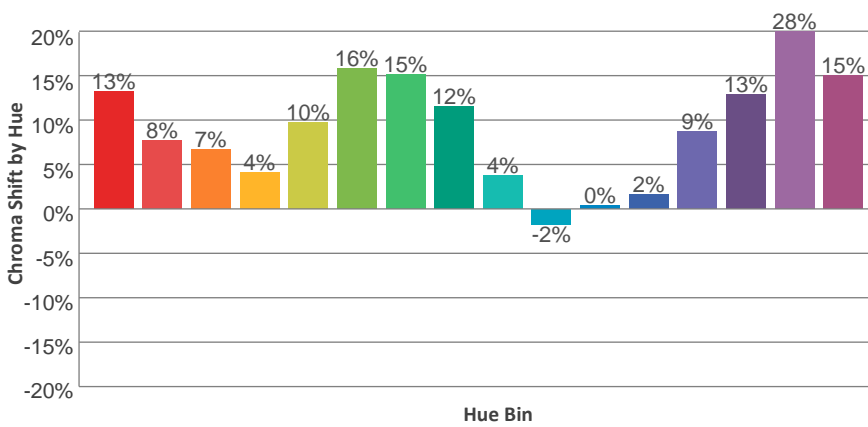
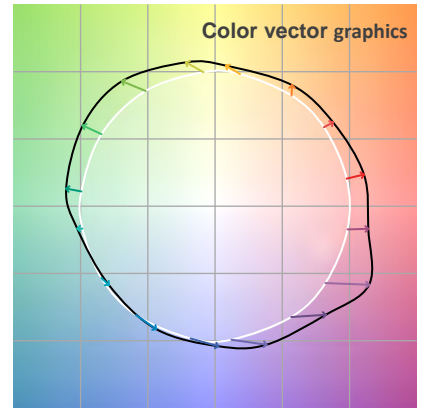
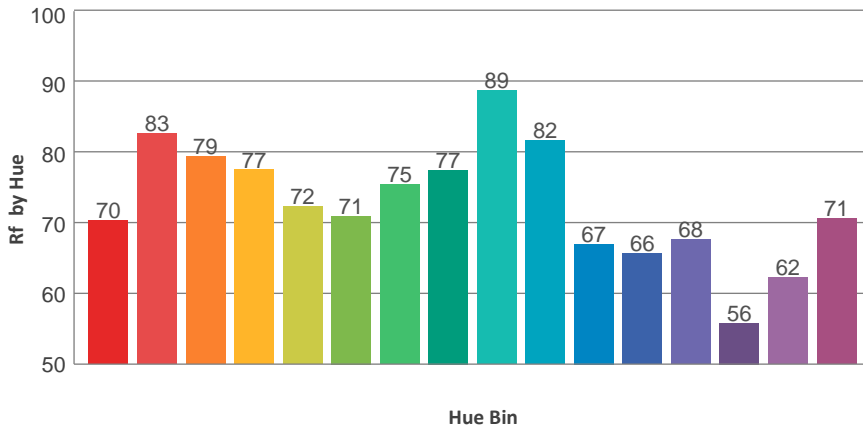
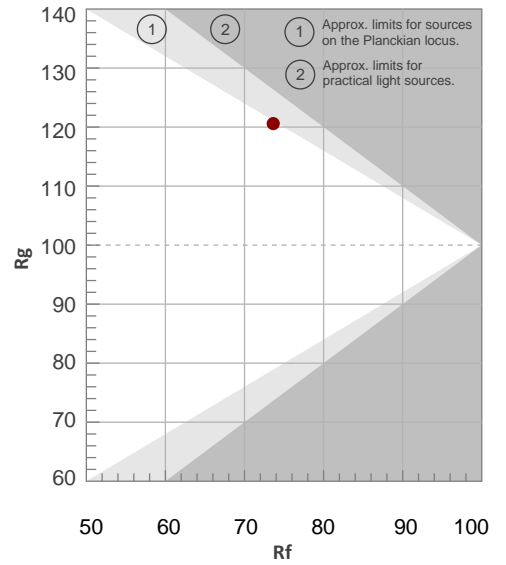
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
6212 K	69.3	-37.5	73.6	120.6	83.9	0.323	0.284	0.224	0.296	-0.0307

TM30 Details

Rf 73.6
Fidelity Index Rf

Rg 120.6
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	70	13%	1%
2	83	8%	-1%
3	79	7%	4%
4	77	4%	11%
5	72	10%	11%
6	71	16%	11%
7	75	15%	2%
8	77	12%	0%
9	89	4%	-1%
10	82	-2%	7%
11	67	0%	18%
12	66	2%	21%
13	68	9%	25%
14	56	13%	22%
15	62	28%	17%
16	71	15%	3%



Total Lumen Output: 7747 lm

Color Temperature: 2675 K

CRI: 90.1

TLCI: 80

TM30: 87.6

CQS: 89.3

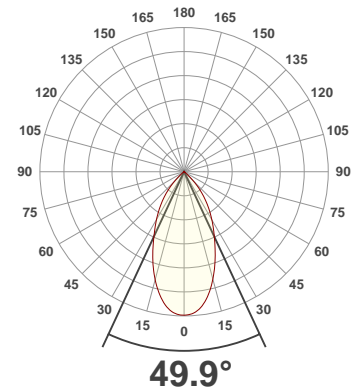
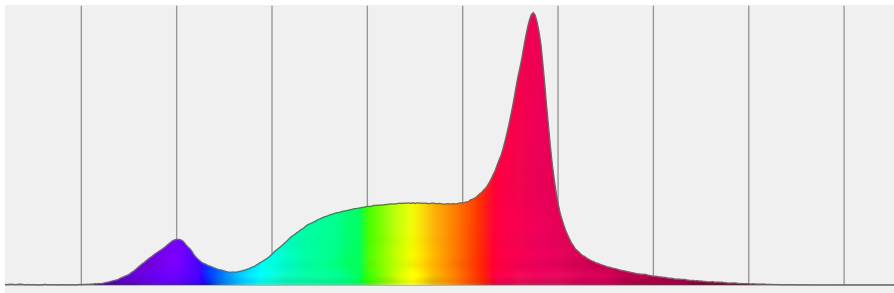
Measurement Date: 3/10/2020

Voltage: 113 V, Current: 1.01 A

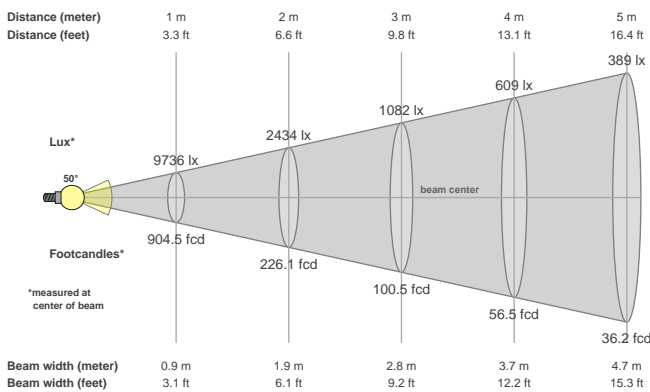
Power: 111.5 W

Efficacy: 69 Lumen/Watt

Spectral distribution
Dominant Wavelength 585



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.9°	89.6°	100.4°

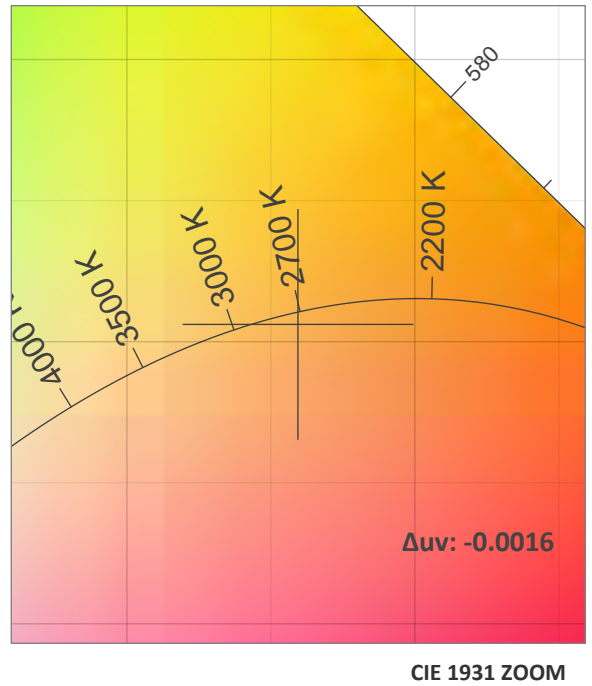
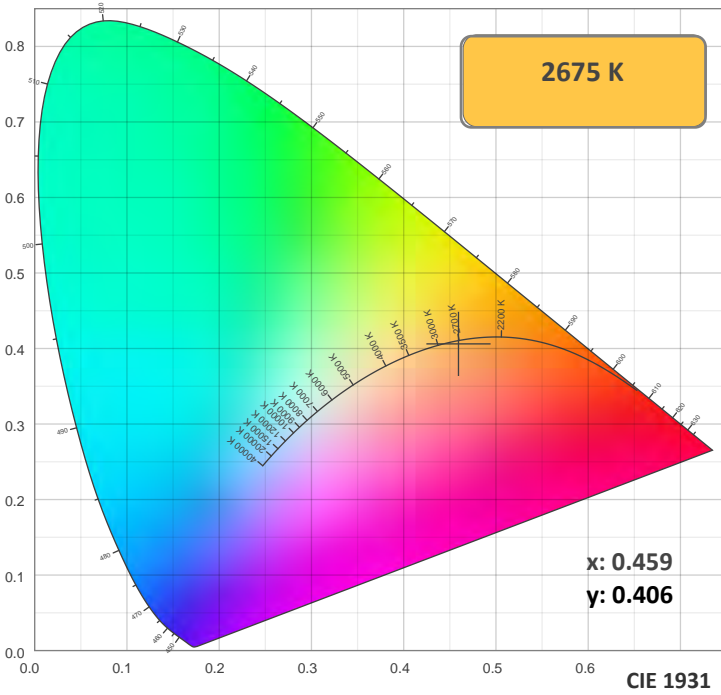
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
9741 cd	99.9%	96.3%

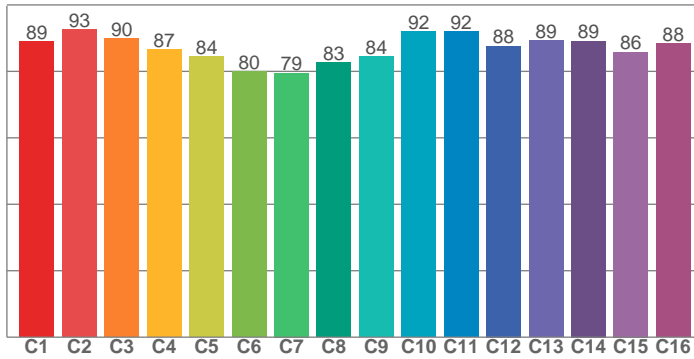
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	9736	2434	1082	609	389	270	199	152	120	97	80	68	58	50	43	38	34	30	27	24
FC	904.5	226.1	100.5	56.5	36.2	25.1	18.5	14.1	11.2	9	7.5	6.3	5.4	4.6	4	3.5	3.1	2.8	2.5	2.3

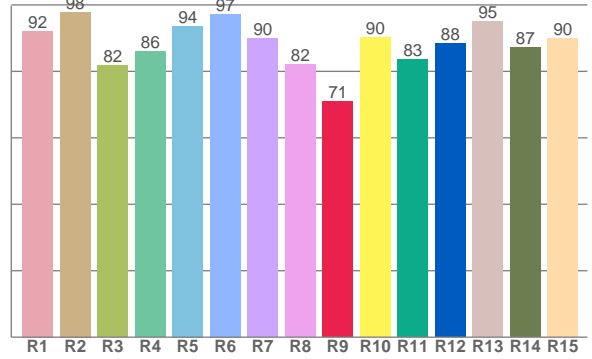
Color Details



TM30: 87.6



CRI: 90.1 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
92.1	97.9	81.7	86.0	93.7	97.3	89.9	82.0	70.9	90.2	83.5	88.3	95.0	87.3	89.9

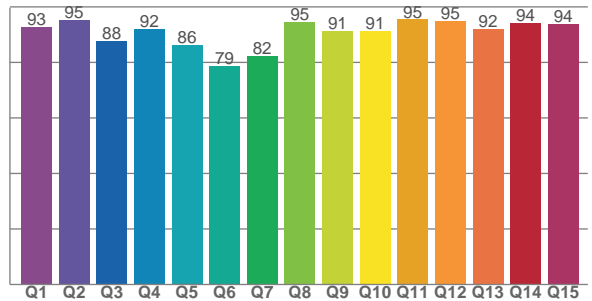
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
89.0	92.5	89.9	86.6	84.4	79.9	79.5	82.7	84.5	92.0	91.9	87.7	89.3	89.1	85.9	88.5

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
92.8	95.3	87.6	92.0	86.4	78.7	82.5	94.6	91.2	91.2	95.5	94.8	92.0	94.3	93.7

CQS: 89.3



Color Parameters

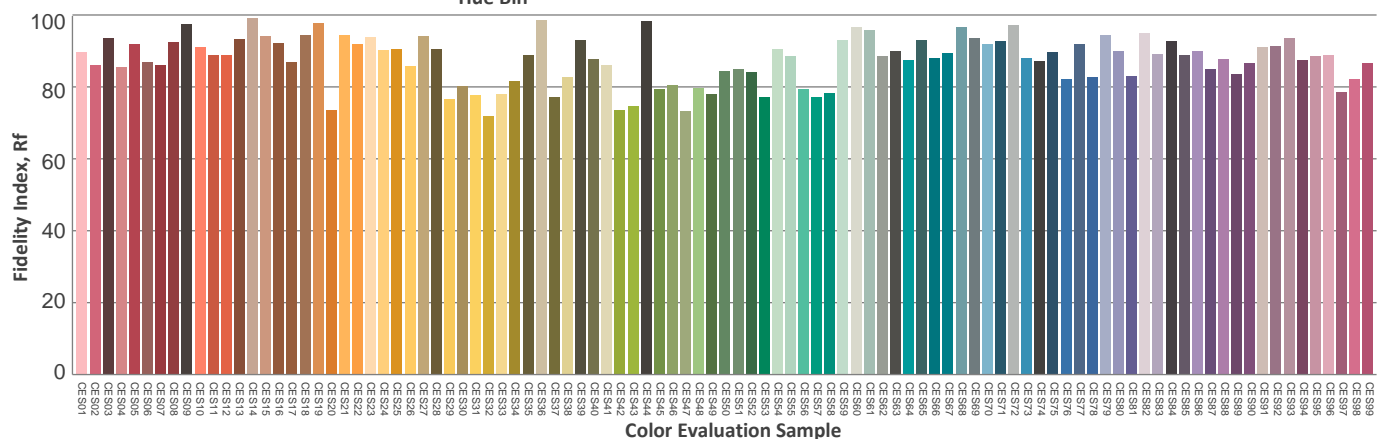
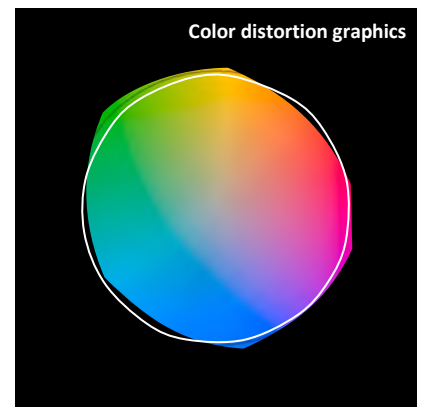
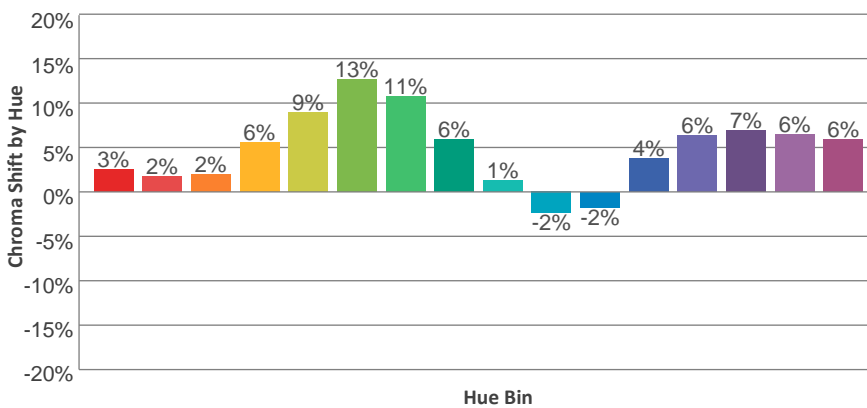
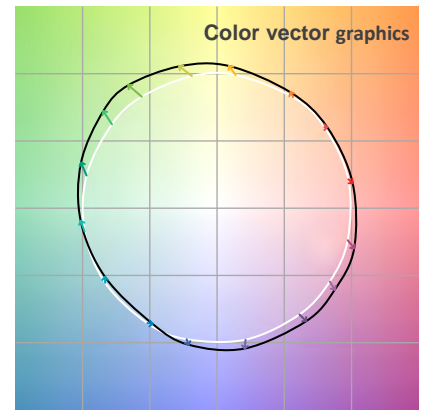
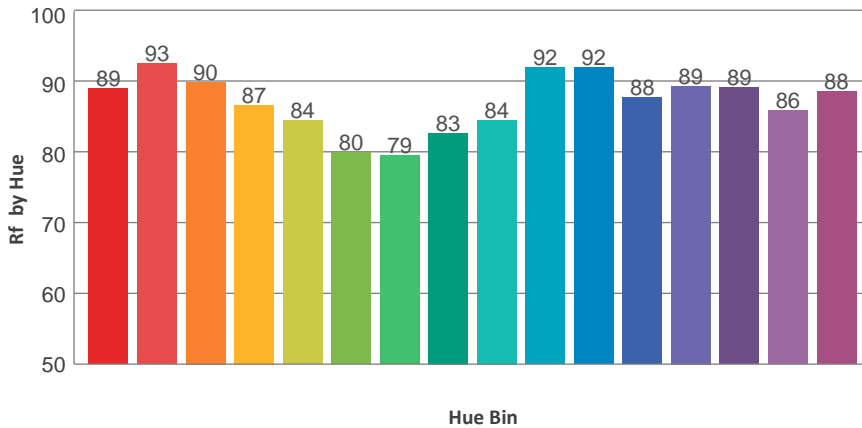
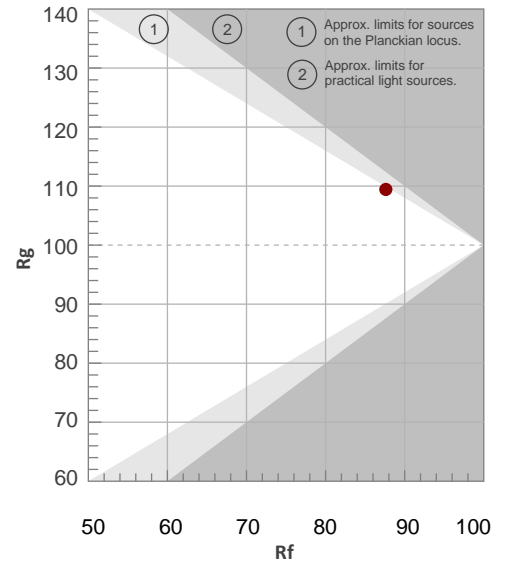
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Division from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
2675 K	90.1	70.9	87.6	109.4	89.3	0.459	0.406	0.264	0.350	-0.0016

TM30 Details

Rf 87.6
Fidelity Index Rf

Rg 109.4
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	89	3%	-3%
2	93	2%	-1%
3	90	2%	4%
4	87	6%	6%
5	84	9%	8%
6	80	13%	4%
7	79	11%	-5%
8	83	6%	-9%
9	84	1%	-8%
10	92	-2%	-4%
11	92	-2%	3%
12	88	4%	2%
13	89	6%	-2%
14	89	7%	1%
15	86	6%	-3%
16	88	6%	-5%



Total Lumen Output: 9324 lm

Color Temperature: 3225 K

CRI: 88.8

TLCI: 83

TM30: 87.8

CQS: 90.7

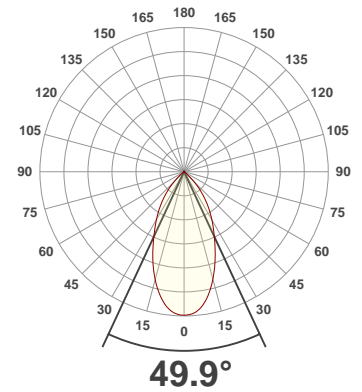
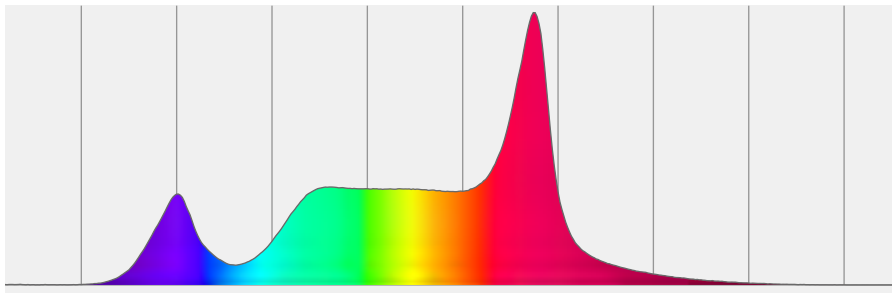
Measurement Date: 3/10/2020

Voltage: 113 V, Current: 1.55 A

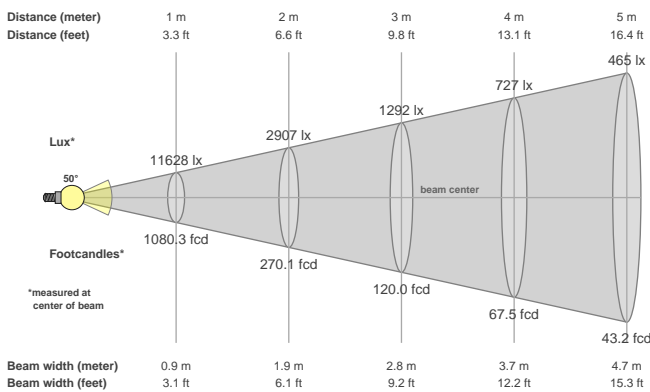
Power: 171 W

Efficacy: 55 Lumen/Watt

Spectral distribution
Dominant Wavelength 584



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.9°	89.9°	101.3°

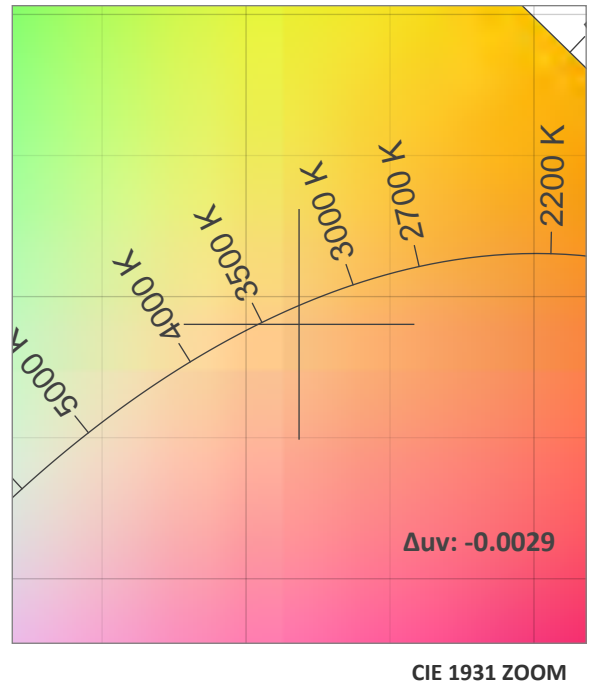
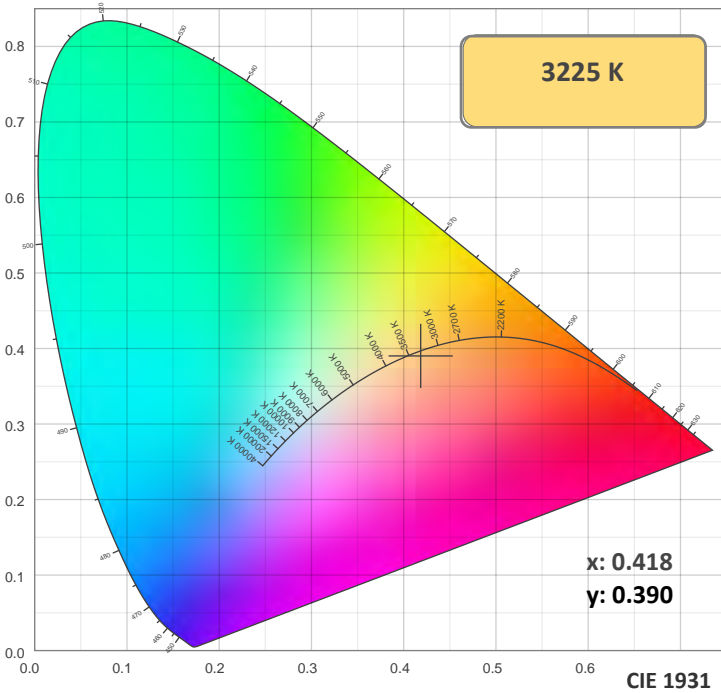
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
11634 cd	99.7%	95.7%

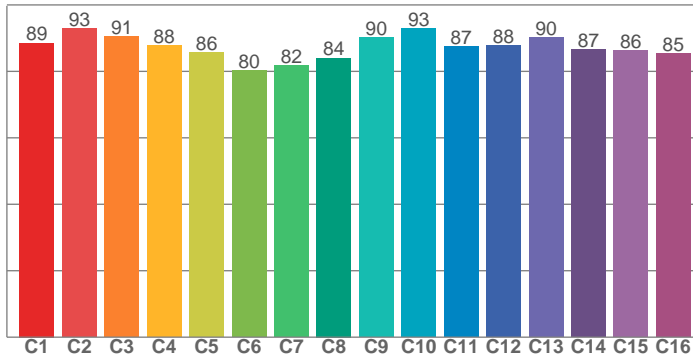
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	11628	2907	1292	727	465	323	237	182	144	116	96	81	69	59	52	45	40	36	32	29
FC	1080.3	270.1	120	67.5	43.2	30	22	16.9	13.3	10.8	8.9	7.5	6.4	5.5	4.8	4.2	3.7	3.3	3	2.7

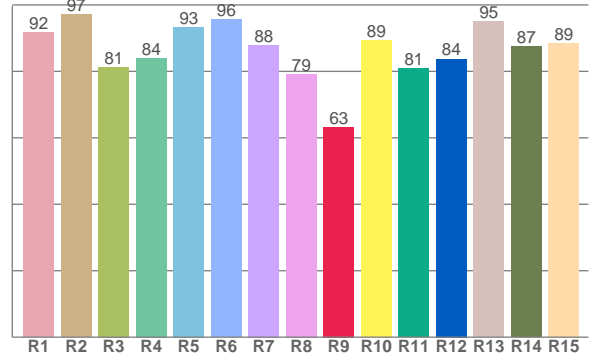
Color Details



TM30: 87.8



CRI: 88.8 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
91.7	97.0	81.3	84.0	93.4	95.7	87.9	79.2	63.3	89.3	80.9	83.8	94.9	87.5	88.5

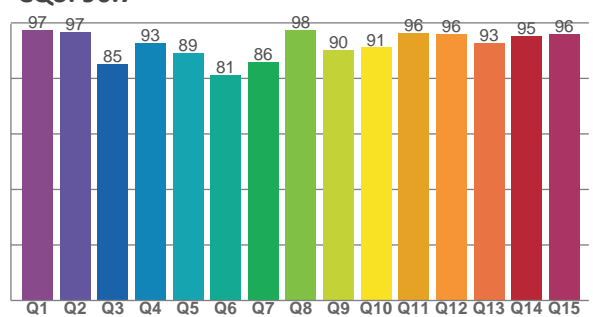
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
88.6	92.9	90.5	87.9	85.6	80.3	81.7	84.0	90.2	92.9	87.4	87.8	90.1	86.6	86.3	85.4

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
97.4	96.8	85.2	92.8	89.2	81.3	85.8	97.5	90.3	91.1	96.5	96.0	92.9	95.3	96.0

CQS: 90.7



Color Parameters

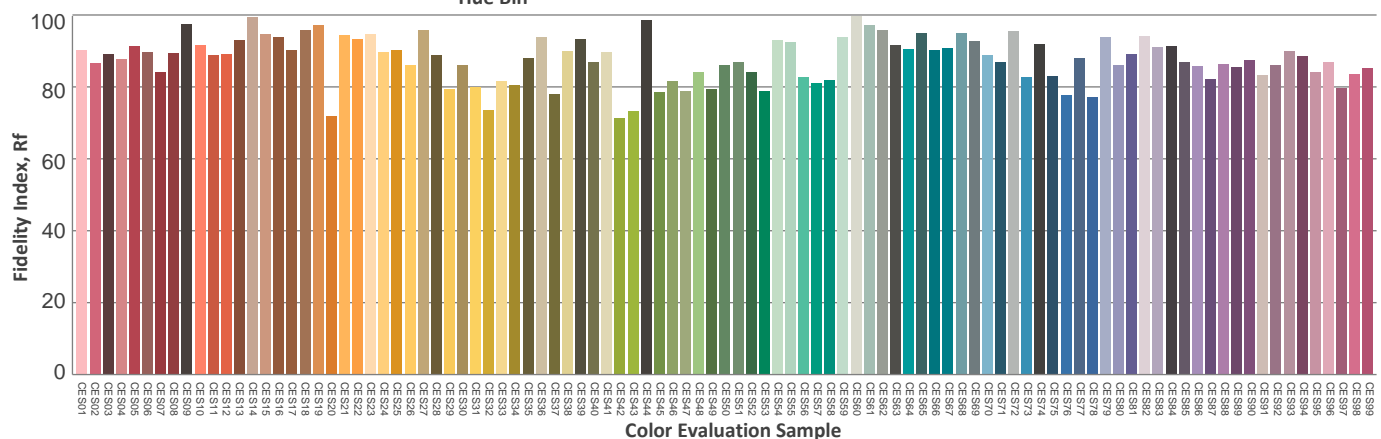
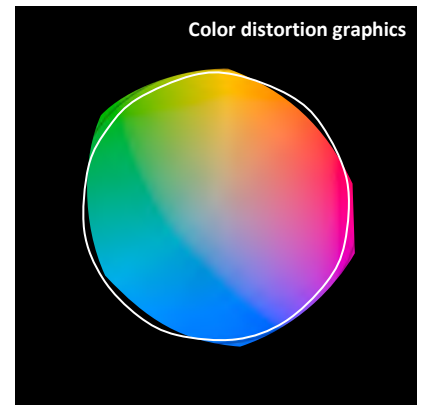
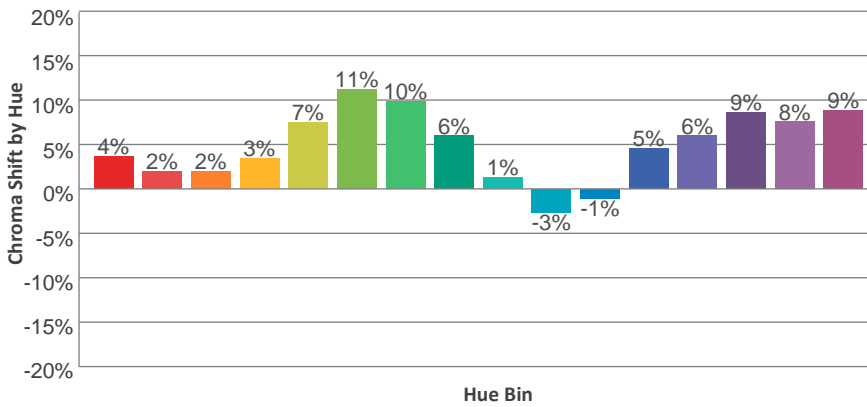
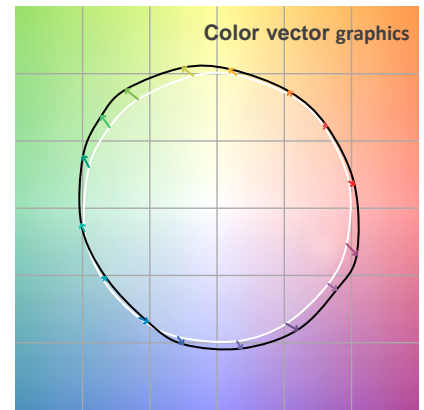
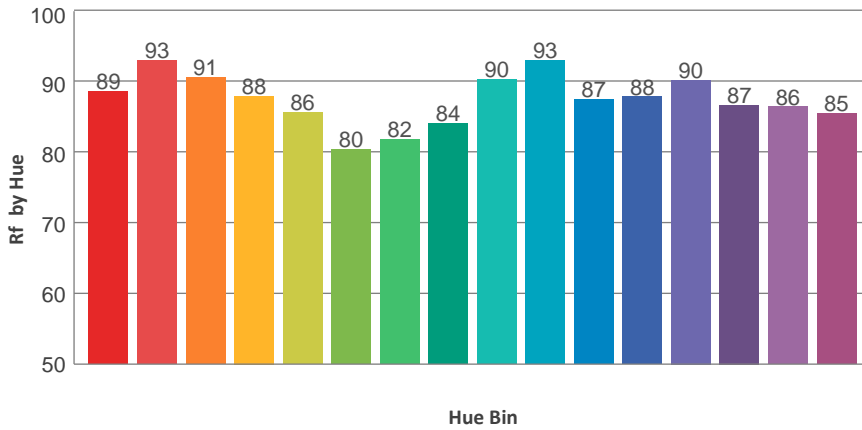
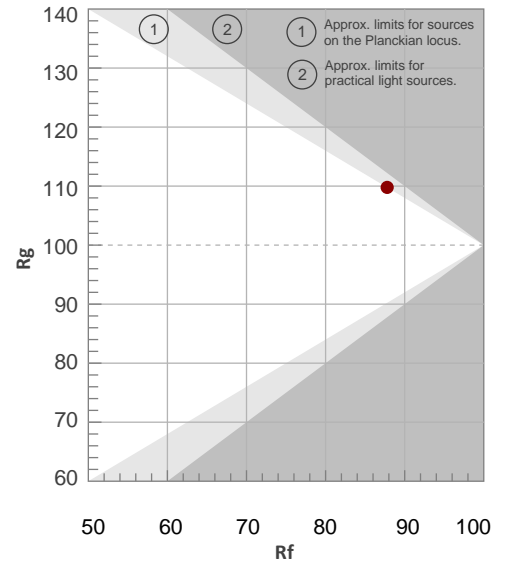
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
3225 K	88.8	63.3	87.8	109.8	90.7	0.418	0.390	0.245	0.342	-0.0029

TM30 Details

Rf 87.8
Fidelity Index Rf

Rg 109.8
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	89	4%	-3%
2	93	2%	-1%
3	91	2%	3%
4	88	3%	6%
5	86	7%	7%
6	80	11%	4%
7	82	10%	-4%
8	84	6%	-7%
9	90	1%	-6%
10	93	-3%	-1%
11	87	-1%	7%
12	88	5%	4%
13	90	6%	2%
14	87	9%	4%
15	86	8%	0%
16	85	9%	-6%



Total Lumen Output: 9717 lm

Color Temperature: 4195 K

CRI: 88.4

TLCI: 83

TM30: 86.9

CQS: 91.0

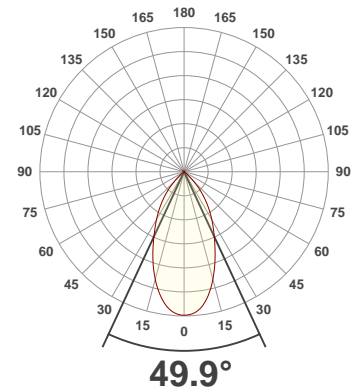
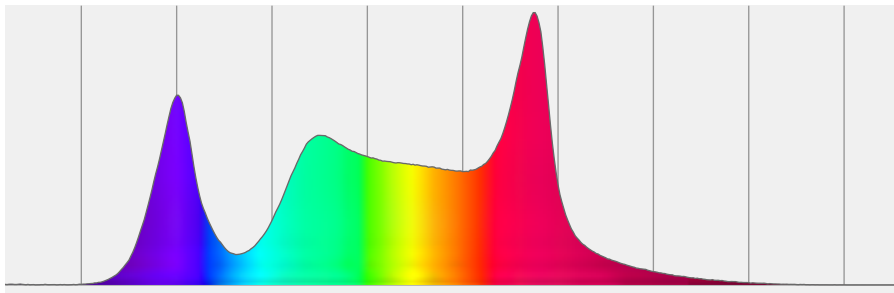
Measurement Date: 3/10/2020

Voltage: 113 V, Current: 1.73 A

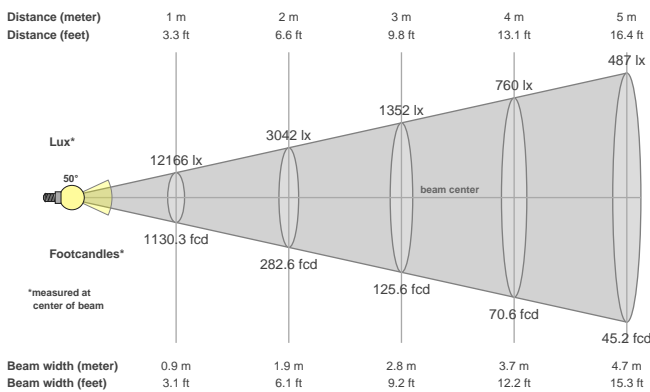
Power: 191.4 W

Efficacy: 51 Lumen/Watt

Spectral distribution
Dominant Wavelength 583



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.9°	89.8°	101.2°

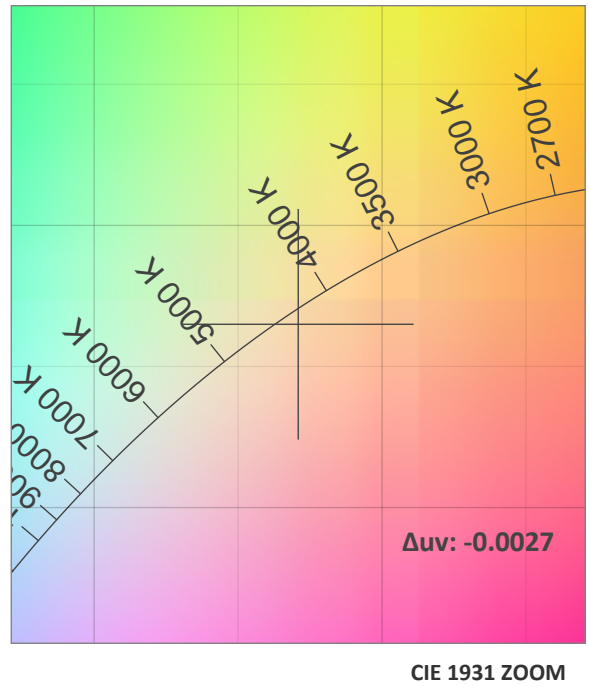
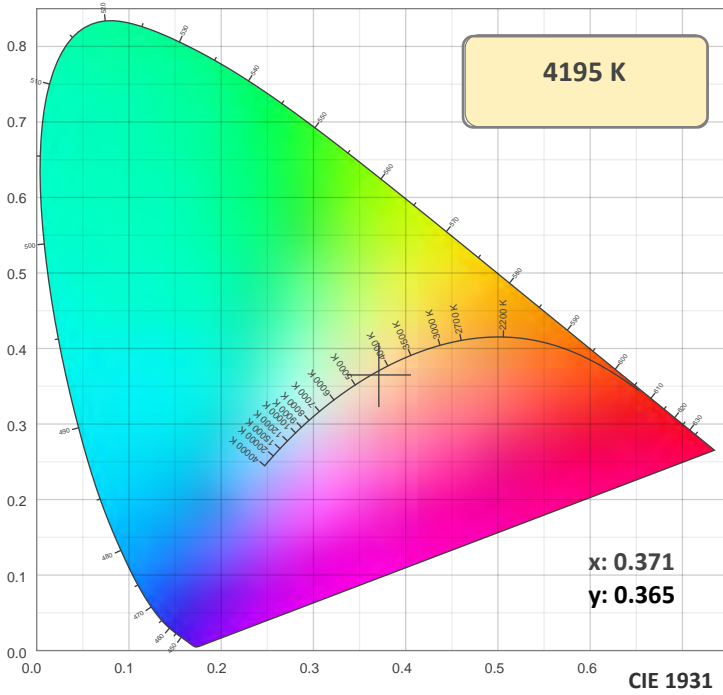
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
12173 cd	99.8%	95.9%

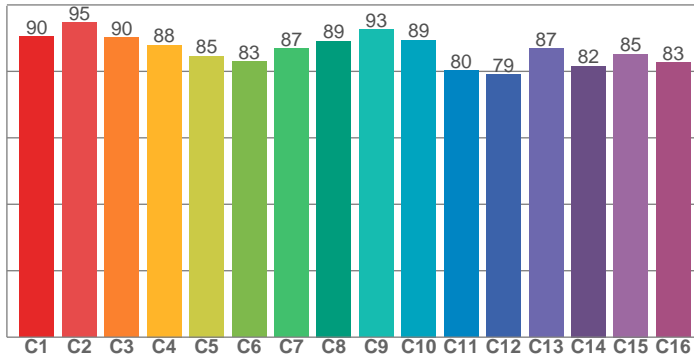
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	12166	3042	1352	760	487	338	248	190	150	122	101	84	72	62	54	48	42	38	34	30
FC	1130.3	282.6	125.6	70.6	45.2	31.4	23.1	17.7	14	11.3	9.3	7.8	6.7	5.8	5	4.4	3.9	3.5	3.1	2.8

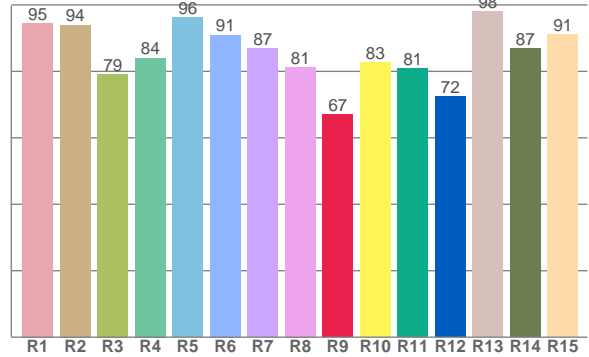
Color Details



TM30: 86.9



CRI: 88.4 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
94.5	94.0	79.2	84.1	96.2	91.0	86.9	81.3	67.0	82.6	81.0	72.3	98.0	86.8	91.1

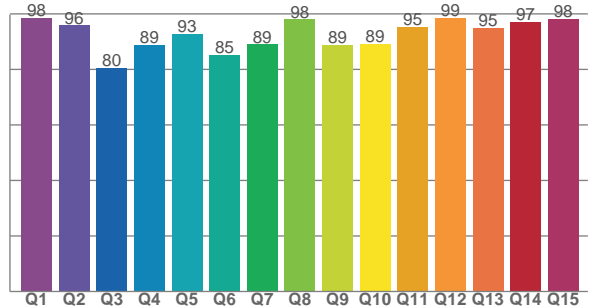
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.4	94.6	90.2	87.9	84.6	83.0	86.9	89.2	92.6	89.4	80.4	79.1	87.0	81.6	85.2	82.7

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.5	95.8	80.5	88.9	92.8	85.3	89.0	98.0	88.7	89.3	95.3	98.5	94.9	97.1	98.2

CQS: 91.0



Color Parameters

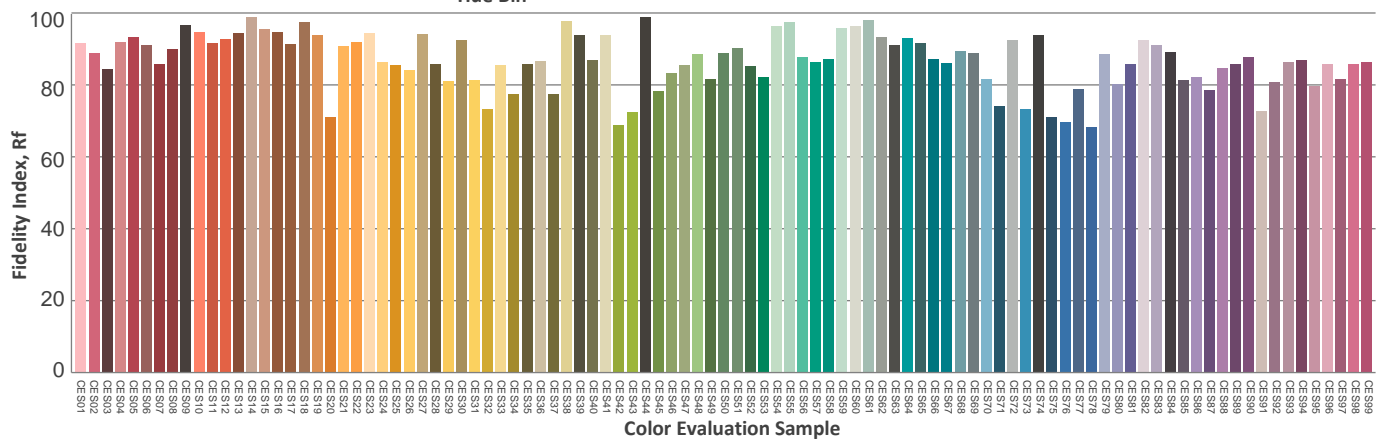
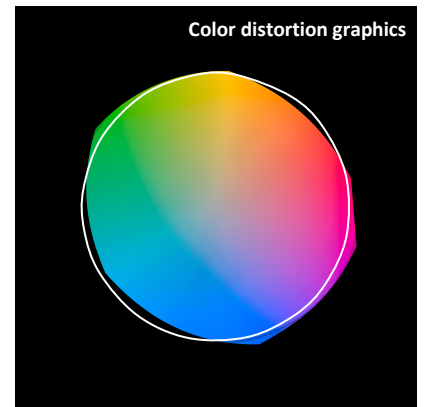
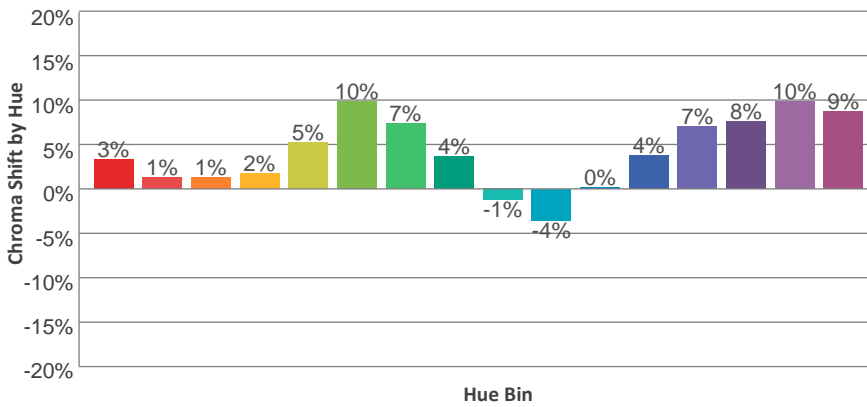
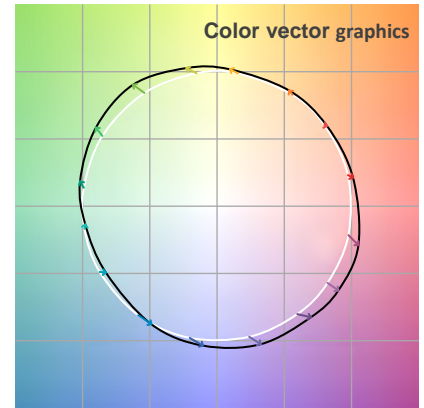
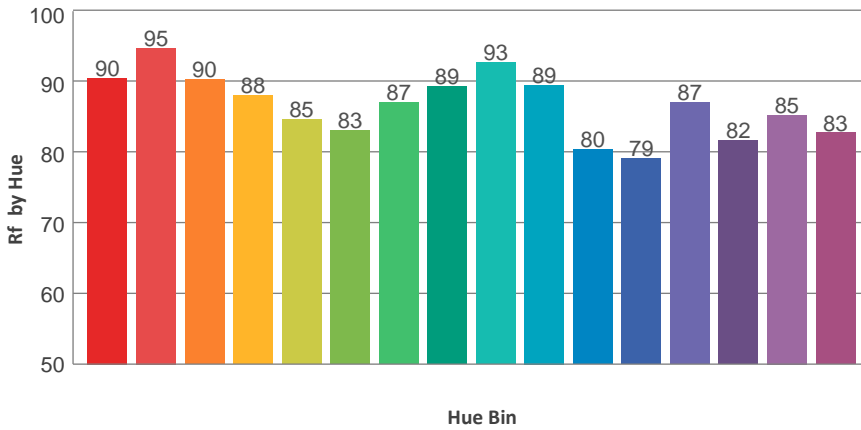
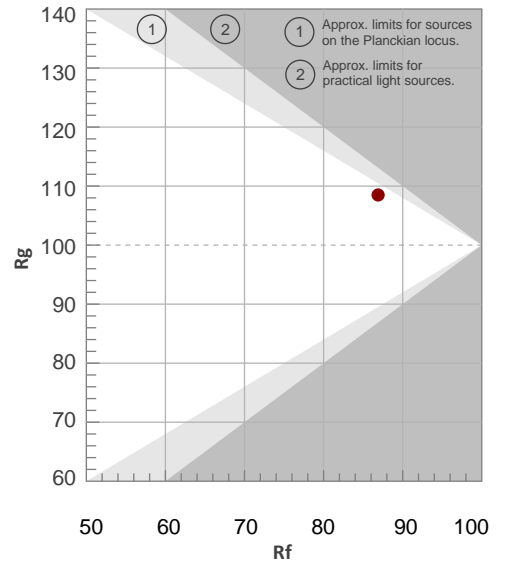
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
4195 K	88.4	67.0	86.9	108.5	91.0	0.371	0.365	0.223	0.330	-0.0027

TM30 Details

Rf 86.9
Fidelity Index Rf

Rg 108.5
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	90	3%	-2%
2	95	1%	-2%
3	90	1%	4%
4	88	2%	6%
5	85	5%	7%
6	83	10%	4%
7	87	7%	-2%
8	89	4%	-4%
9	93	-1%	-3%
10	89	-4%	3%
11	80	0%	12%
12	79	4%	11%
13	87	7%	7%
14	82	8%	7%
15	85	10%	0%
16	83	9%	-6%



Total Lumen Output: 9820 lm

Color Temperature: 4479 K

CRI: 88.6

TLCI: 84

TM30: 86.6

CQS: 90.6

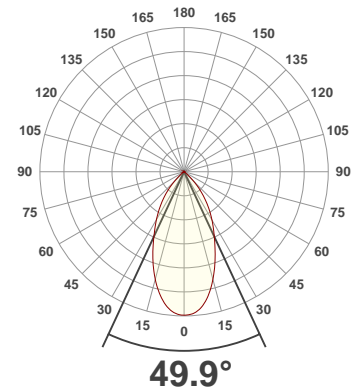
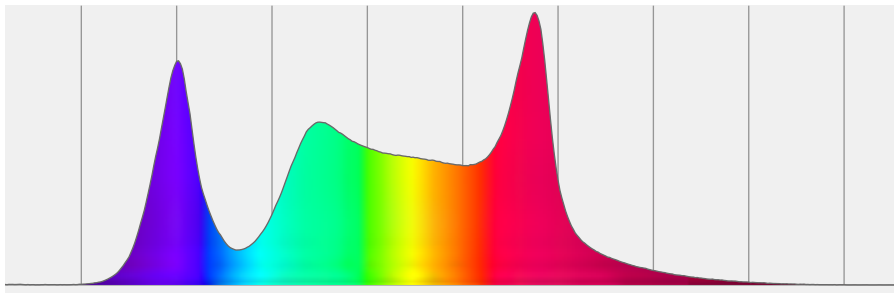
Measurement Date: 3/10/2020

Voltage: 113 V, Current: 1.76 A

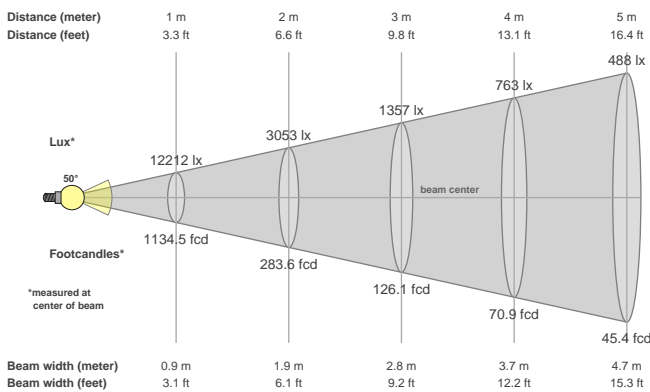
Power: 195 W

Efficacy: 50 Lumen/Watt

Spectral distribution
Dominant Wavelength 584



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.9°	89.9°	101.6°

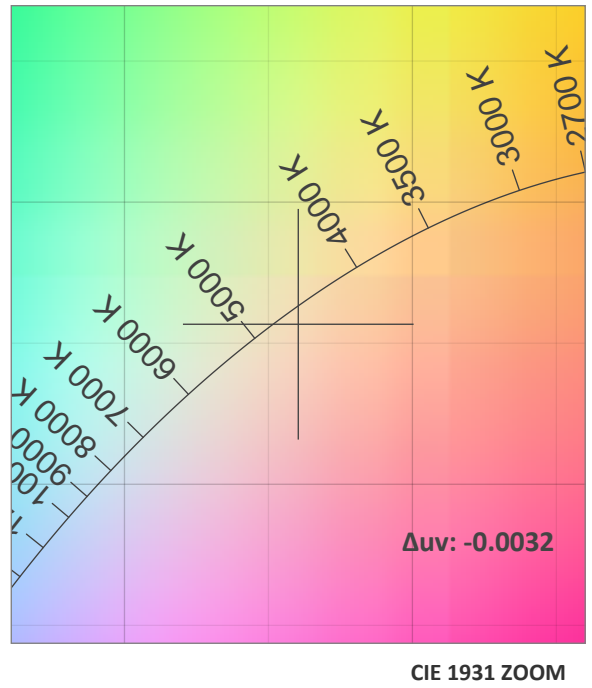
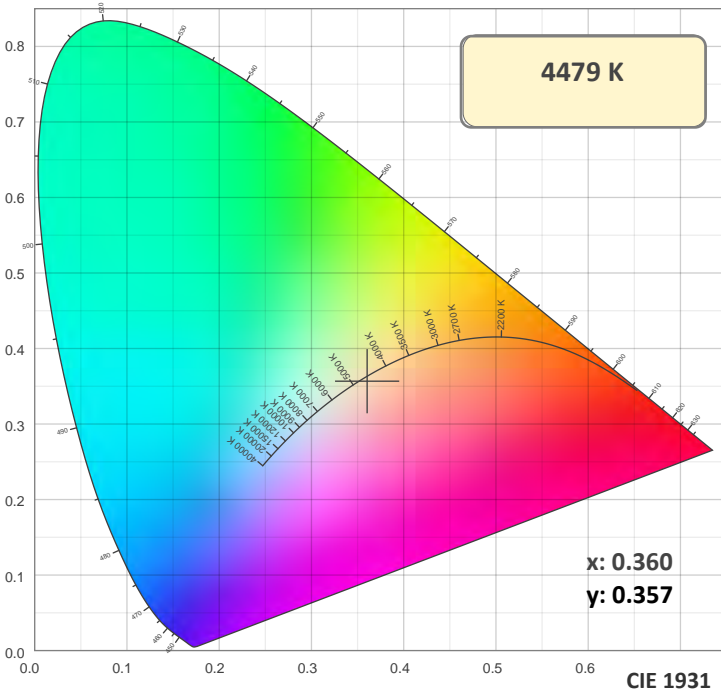
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
12220 cd	99.6%	95.4%

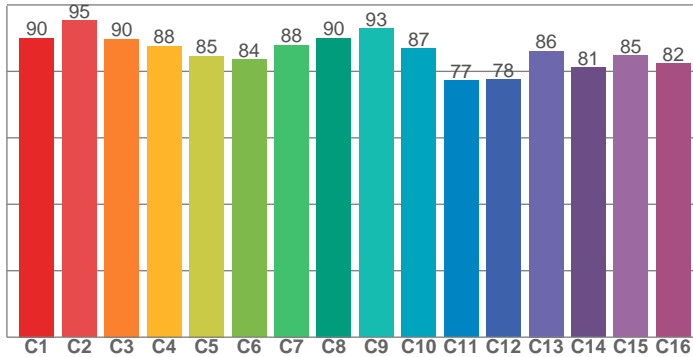
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	12212	3053	1357	763	488	339	249	191	151	122	101	85	72	62	54	48	42	38	34	31
FC	1134.5	283.6	126.1	70.9	45.4	31.5	23.2	17.7	14	11.3	9.4	7.9	6.7	5.8	5	4.4	3.9	3.5	3.1	2.8

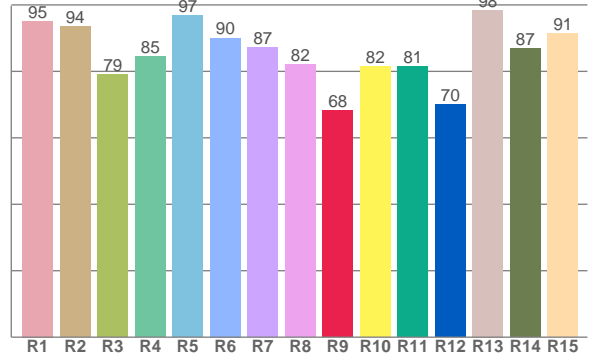
Color Details



TM30: 86.6



CRI: 88.6 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
95.2	93.6	79.0	84.5	96.9	90.1	87.1	82.1	68.1	81.5	81.4	70.1	98.5	86.8	91.5

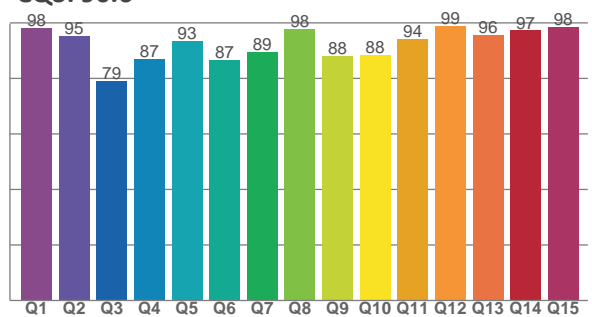
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.1	95.4	89.8	87.7	84.7	83.6	87.9	90.1	92.9	86.9	77.2	77.6	86.1	81.2	84.8	82.4

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.2	95.4	79.0	87.0	93.4	86.5	89.5	97.9	88.1	88.4	94.1	98.8	95.7	97.3	98.4

CQS: 90.6



Color Parameters

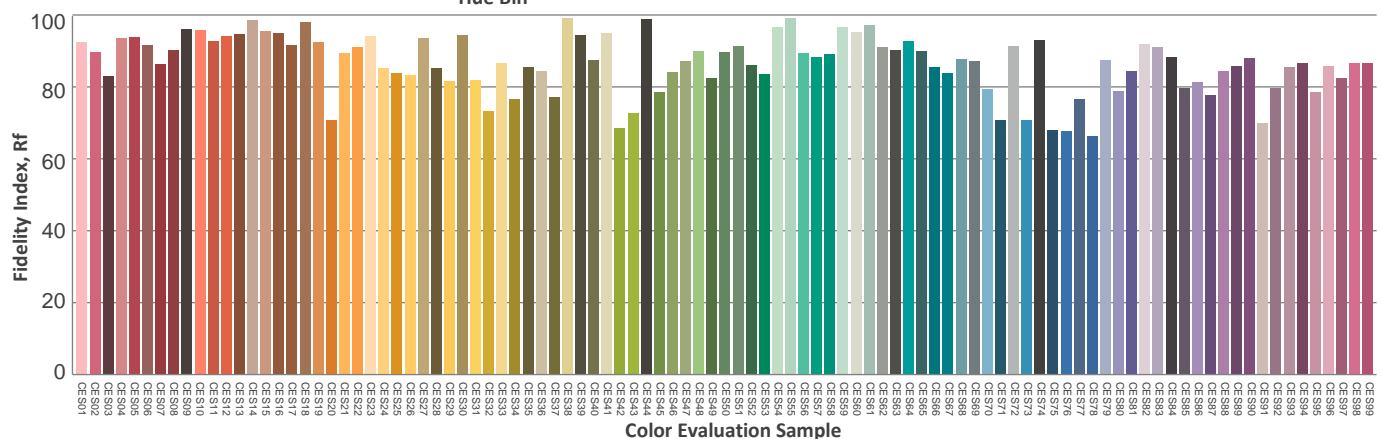
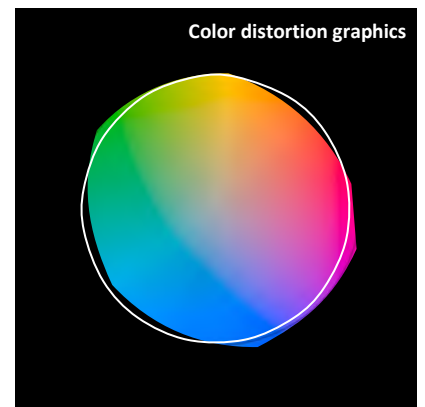
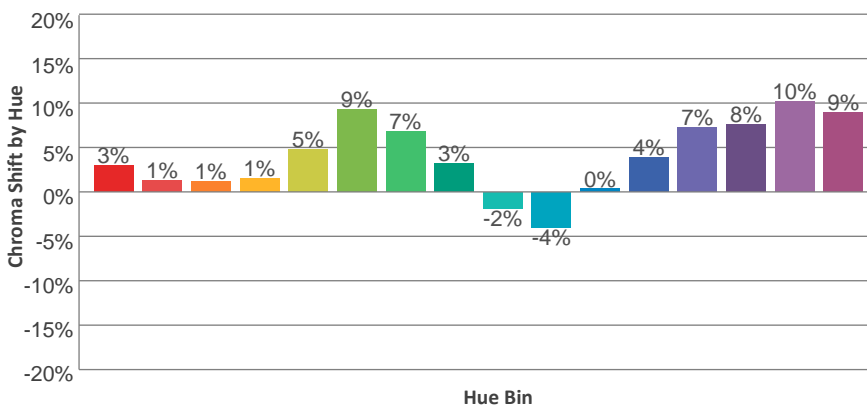
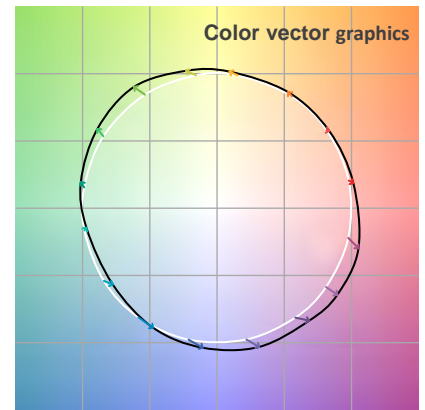
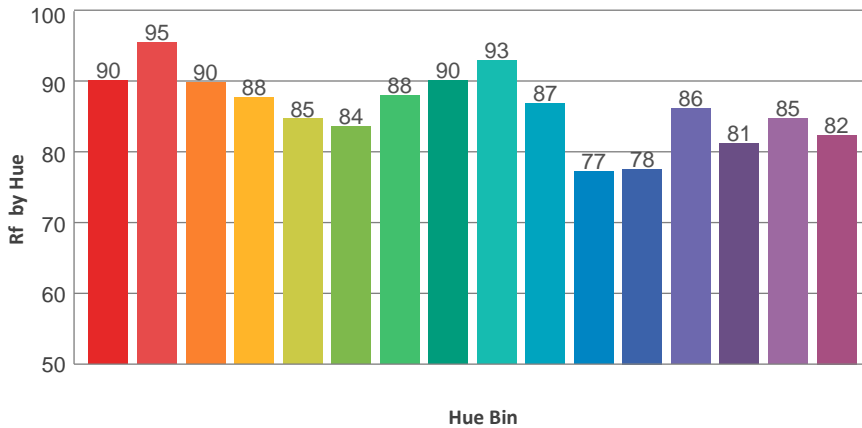
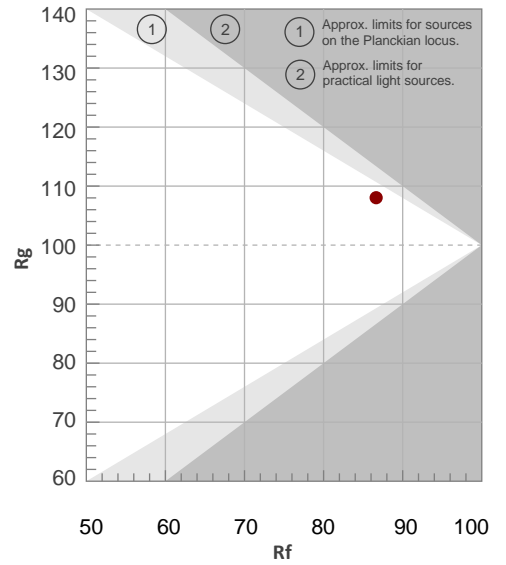
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Division from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
4479 K	88.6	68.1	86.6	108.0	90.6	0.360	0.357	0.220	0.326	-0.0032

TM30 Details

Rf 86.6
Fidelity Index Rf

Rg 108.0
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	90	3%	-2%
2	95	1%	-1%
3	90	1%	4%
4	88	1%	6%
5	85	5%	7%
6	84	9%	4%
7	88	7%	-2%
8	90	3%	-4%
9	93	-2%	-2%
10	87	-4%	6%
11	77	0%	13%
12	78	4%	11%
13	86	7%	8%
14	81	8%	7%
15	85	10%	0%
16	82	9%	-6%



Total Lumen Output: 9746 lm

Color Temperature: 5040 K

CRI: 89.1

TLCI: 85

TM30: 86.2

CQS: 88.6

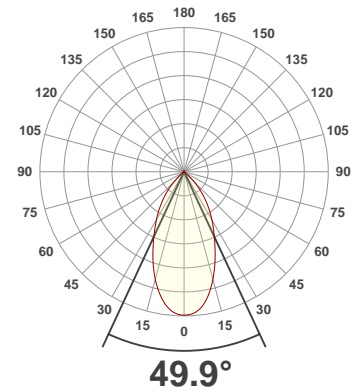
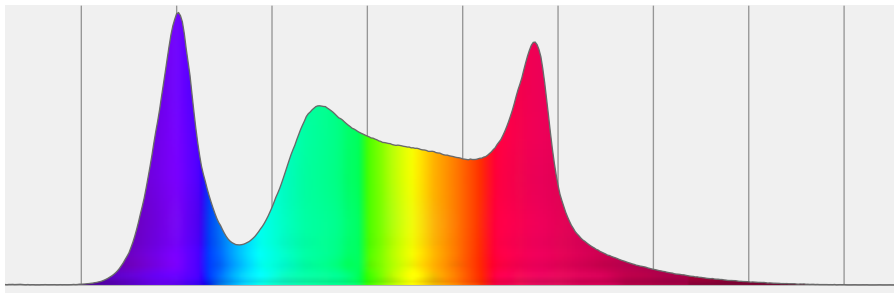
Measurement Date: 3/10/2020

Voltage: 113 V, Current: 1.76 A

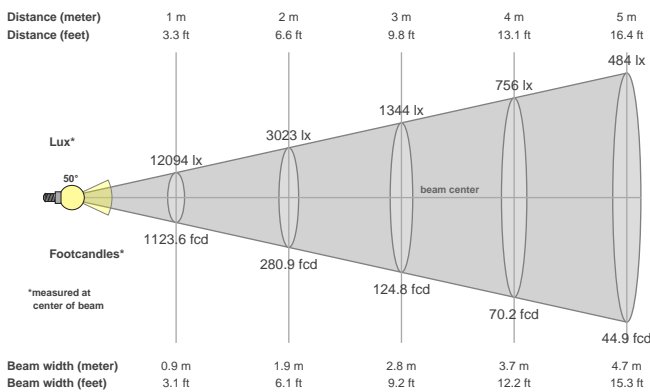
Power: 194.6 W

Efficacy: 50 Lumen/Watt

Spectral distribution
Dominant Wavelength 584



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.9°	89.9°	101.7°

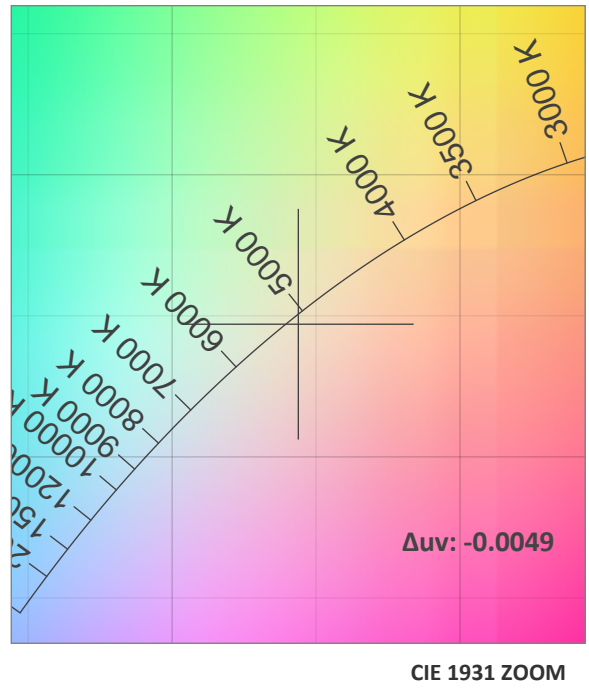
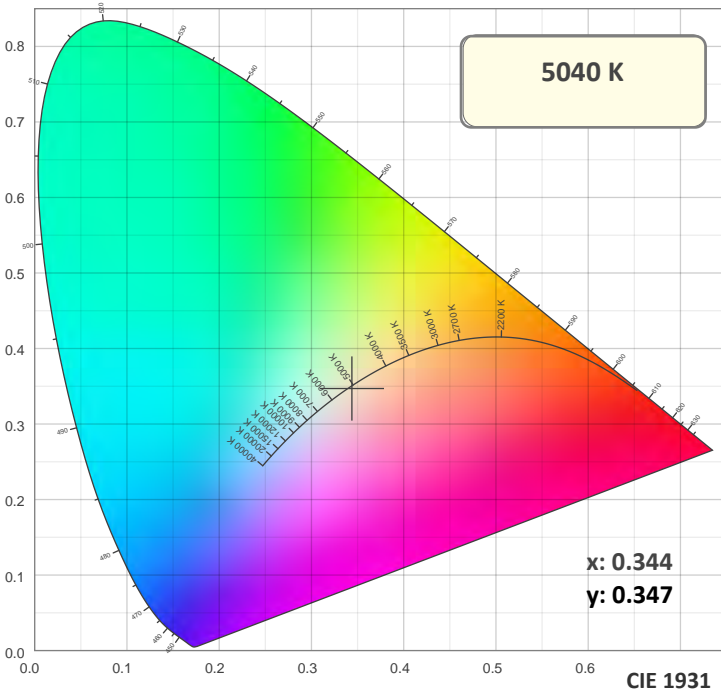
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
12104 cd	99.4%	95.2%

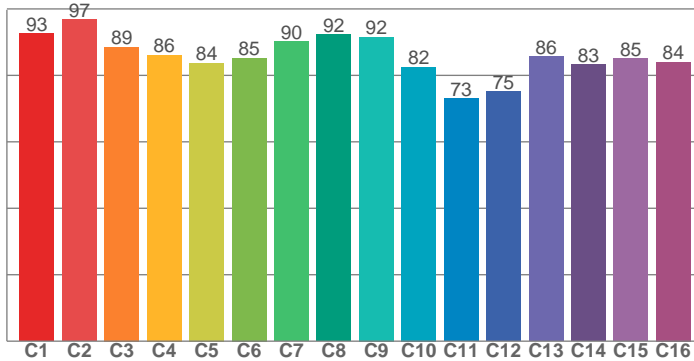
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	12094	3023	1344	756	484	336	247	189	149	121	100	84	72	62	54	47	42	37	34	30
FC	1123.6	280.9	124.8	70.2	44.9	31.2	22.9	17.6	13.9	11.2	9.3	7.8	6.6	5.7	5	4.4	3.9	3.5	3.1	2.8

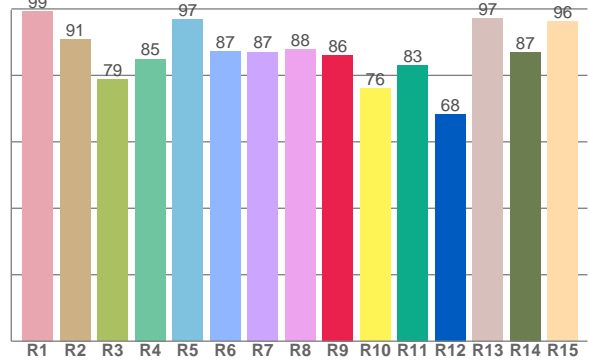
Color Details



TM30: 86.2



CRI: 89.1 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
99.3	90.9	78.8	85.0	96.7	87.1	87.1	87.8	86.2	76.0	83.1	68.4	97.2	87.0	96.2

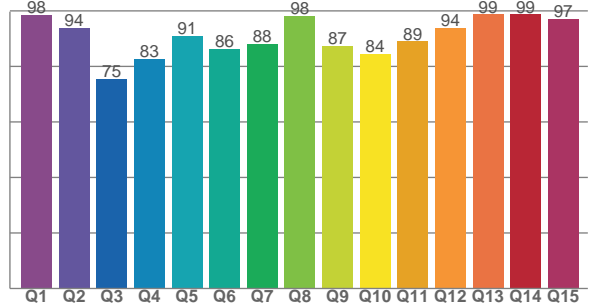
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
92.6	96.8	88.6	86.1	83.7	85.2	90.2	92.3	91.6	82.5	73.1	75.1	85.7	83.2	85.0	84.1

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.4	93.9	75.3	82.6	91.1	86.1	88.2	98.2	87.3	84.5	89.0	93.9	98.7	98.7	97.0

CQS: 88.6



Color Parameters

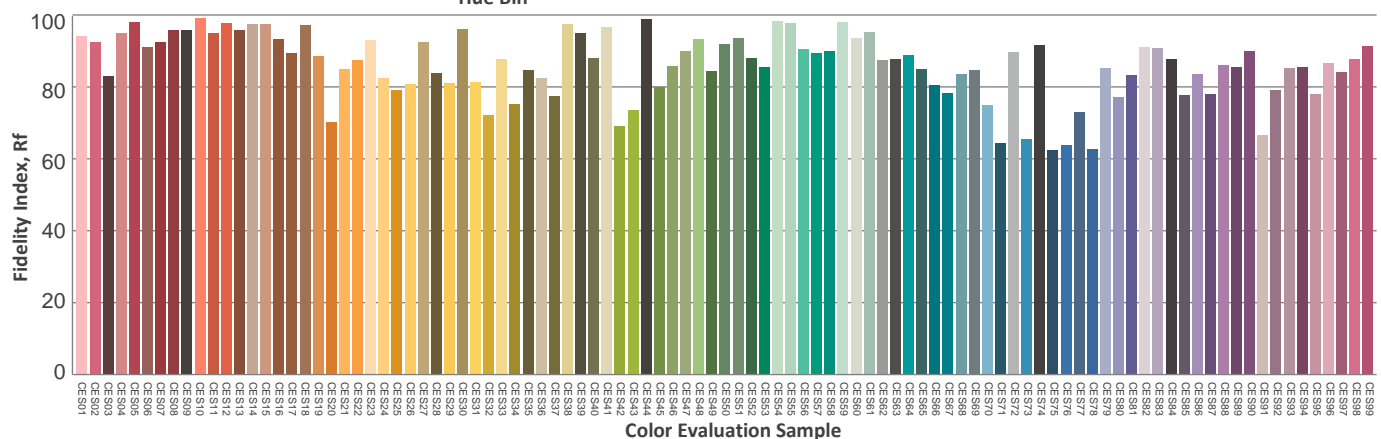
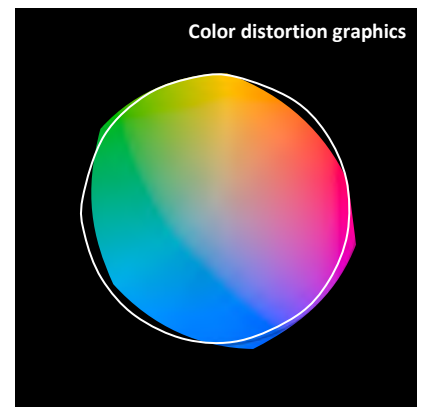
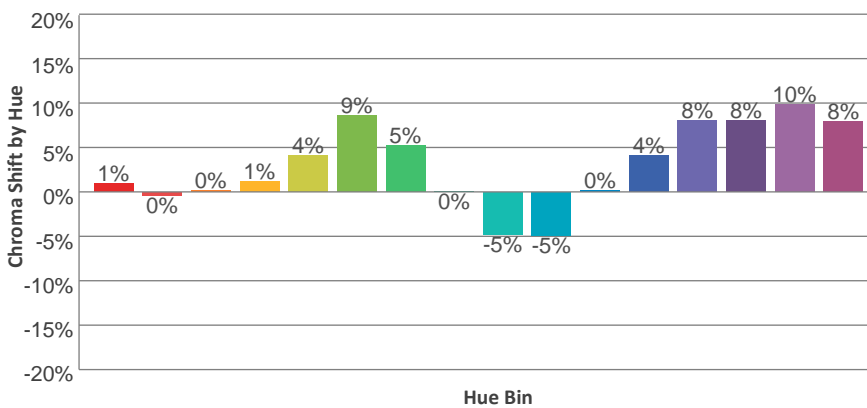
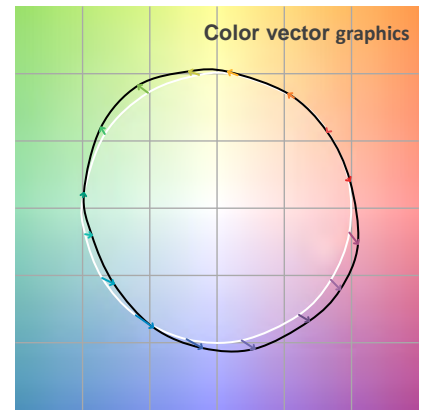
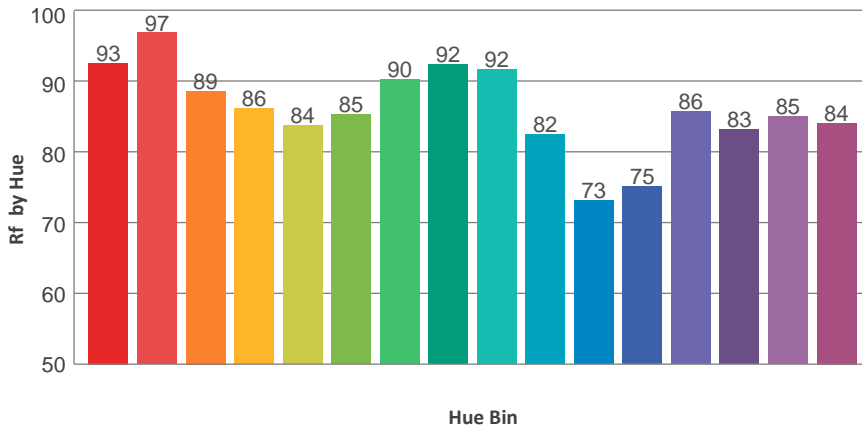
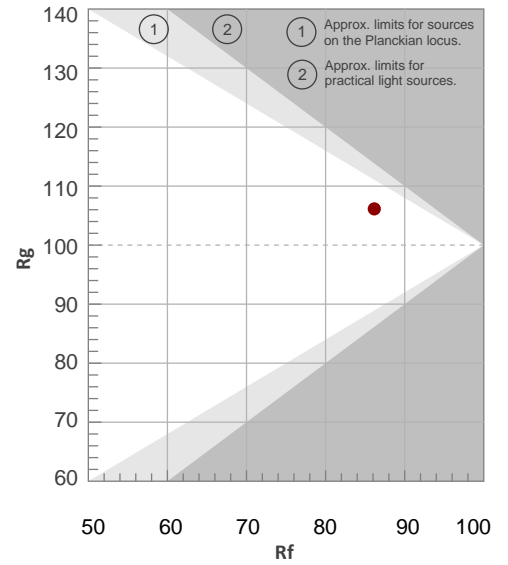
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
5040 K	89.1	86.2	86.2	106.1	88.6	0.344	0.347	0.212	0.321	-0.0049

TM30 Details

Rf 86.2
Fidelity Index Rf

Rg 106.1
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	93	1%	-2%
2	97	0%	0%
3	89	0%	5%
4	86	1%	7%
5	84	4%	7%
6	85	9%	3%
7	90	5%	-2%
8	92	0%	-3%
9	92	-5%	2%
10	82	-5%	8%
11	73	0%	16%
12	75	4%	13%
13	86	8%	8%
14	83	8%	4%
15	85	10%	-2%
16	84	8%	-7%



Total Lumen Output: 9518 lm

Color Temperature: 5545 K

CRI: 88.7

TLCI: 83

TM30: 85.0

CQS: 88.6

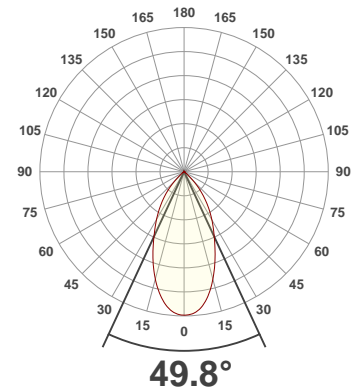
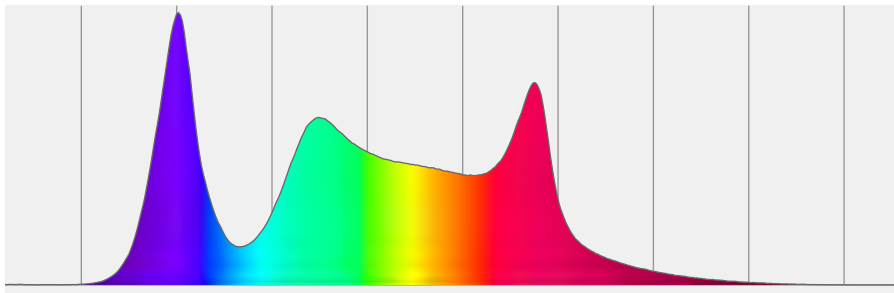
Measurement Date: 3/10/2020

Voltage: 113 V, Current: 1.75 A

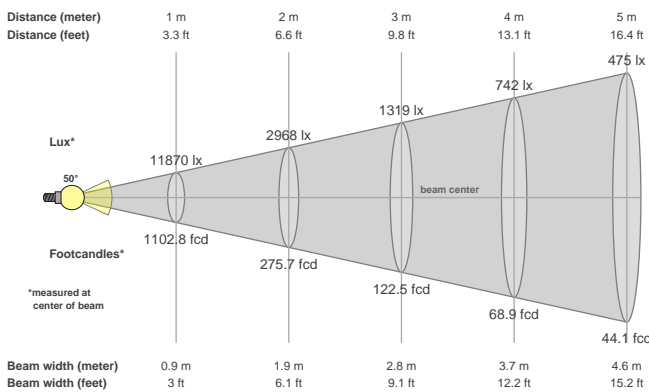
Power: 194 W

Efficacy: 49 Lumen/Watt

Spectral distribution
Dominant Wavelength 588



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.8°	89.9°	101.6°

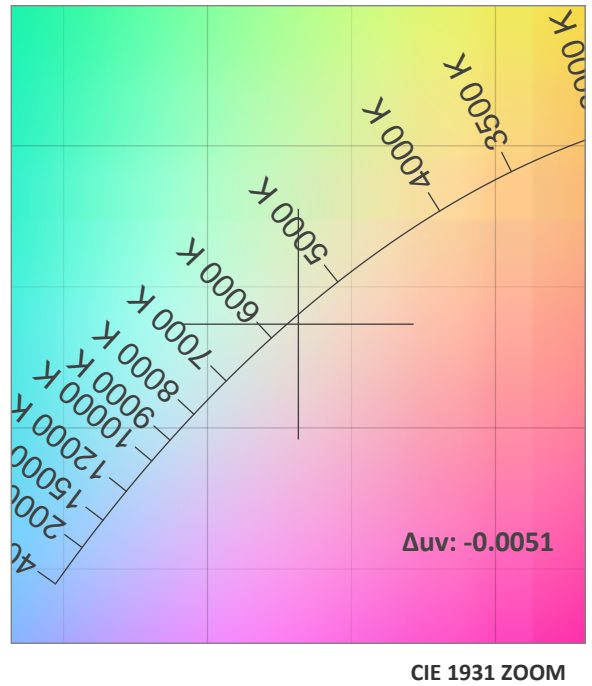
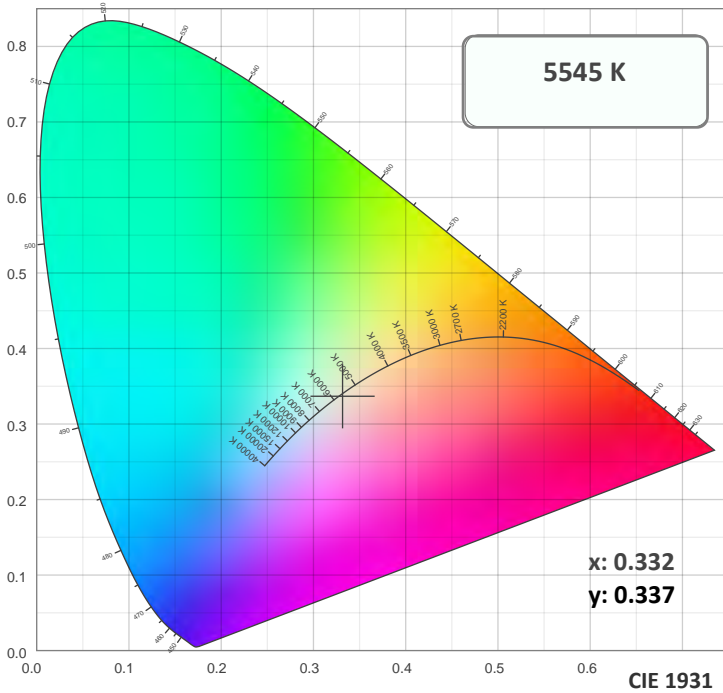
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
11880 cd	99.6%	95.4%

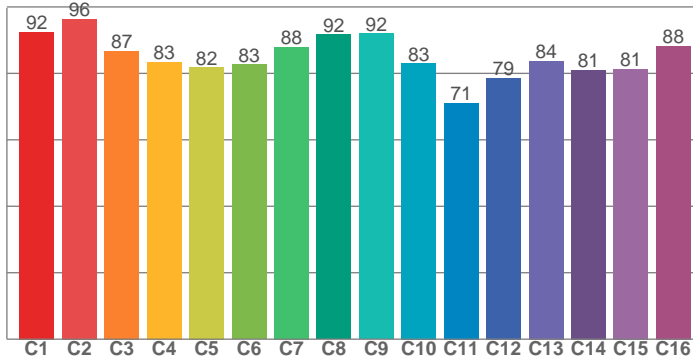
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	11870	2968	1319	742	475	330	242	185	147	119	98	82	70	61	53	46	41	37	33	30
FC	1102.8	275.7	122.5	68.9	44.1	30.6	22.5	17.2	13.6	11	9.1	7.7	6.5	5.6	4.9	4.3	3.8	3.4	3.1	2.8

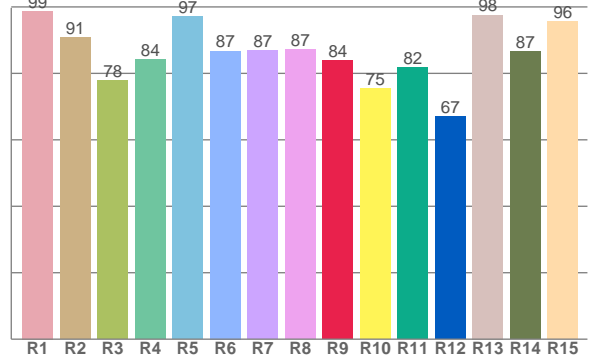
Color Details



TM30: 85.0



CRI: 88.7 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
98.7	90.7	77.9	84.2	97.2	86.8	86.8	87.2	84.0	75.4	81.8	67.0	97.6	86.6	95.7

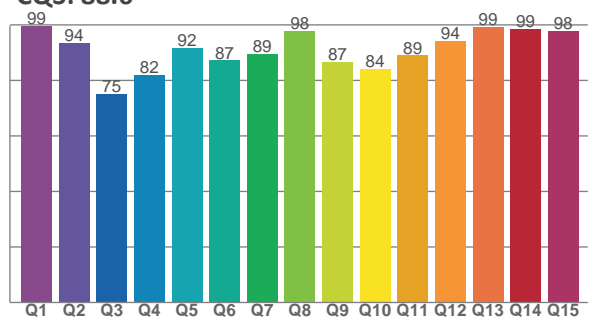
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
92.5	96.4	86.7	83.4	81.9	82.7	87.9	91.6	91.9	83.1	71.1	78.6	83.7	81.0	81.3	88.2

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.5	93.6	75.0	81.9	91.6	87.2	89.5	98.0	86.5	84.2	89.0	94.1	99.1	98.6	97.7

CQS: 88.6



Color Parameters

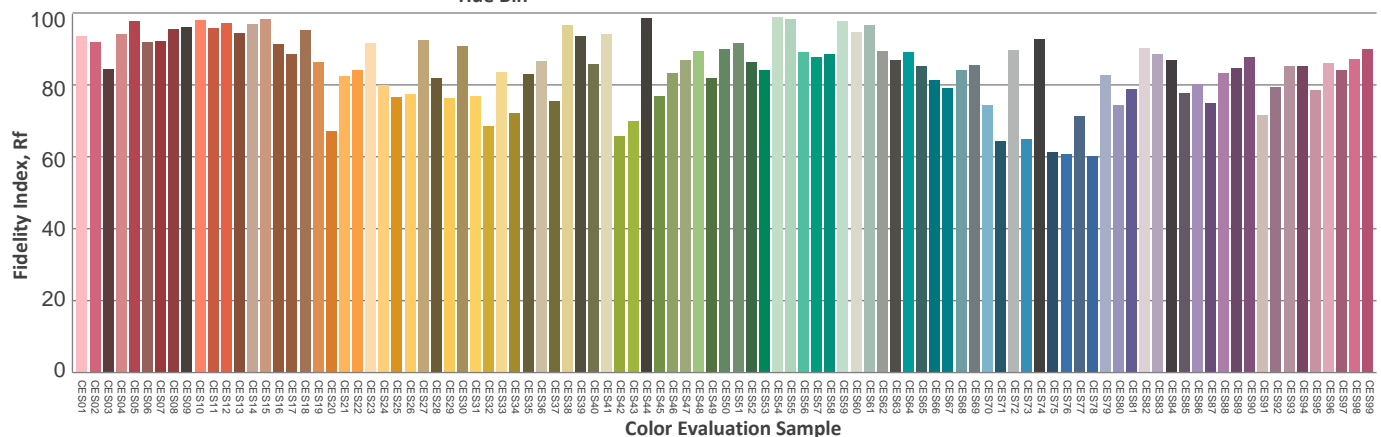
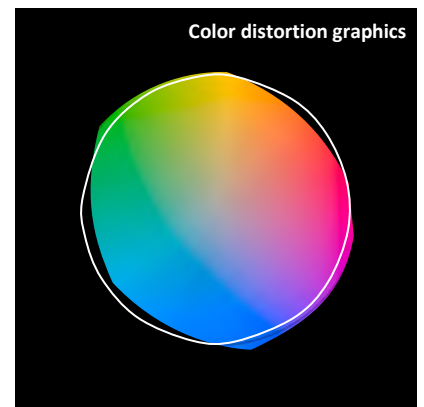
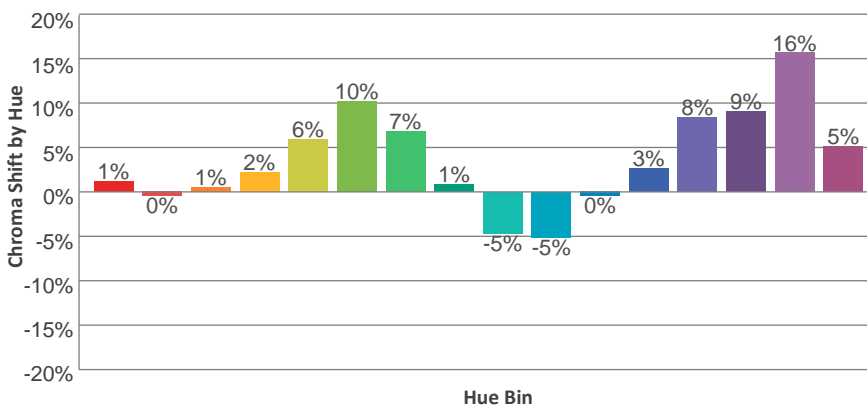
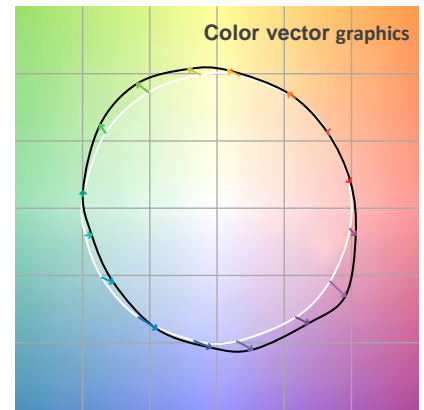
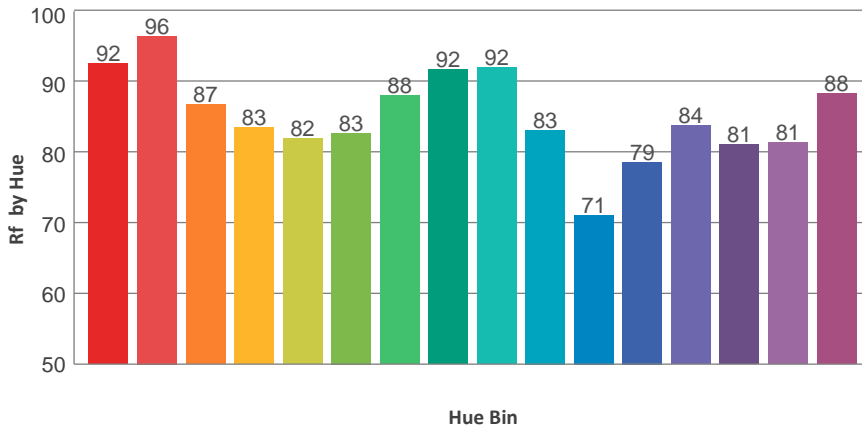
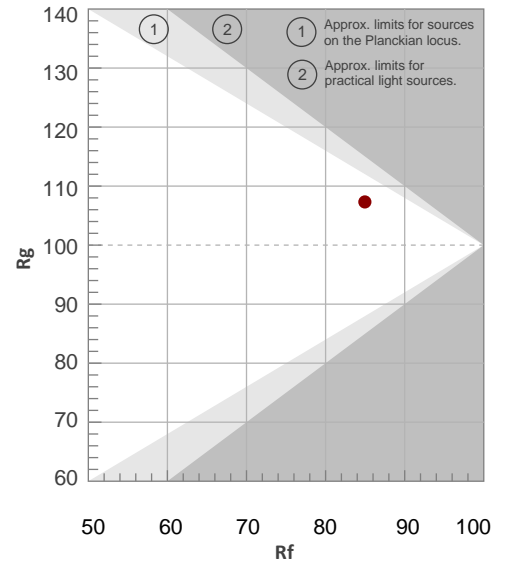
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
5545 K	88.7	84.0	85.0	107.3	88.6	0.332	0.337	0.208	0.317	-0.0051

TM30 Details

Rf 85.0
Fidelity Index Rf

Rg 107.3
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	92	1%	-2%
2	96	0%	0%
3	87	1%	6%
4	83	2%	9%
5	82	6%	8%
6	83	10%	4%
7	88	7%	-3%
8	92	1%	-4%
9	92	-5%	0%
10	83	-5%	8%
11	71	0%	16%
12	79	3%	13%
13	84	8%	10%
14	81	9%	5%
15	81	16%	-3%
16	88	5%	-4%



Total Lumen Output: 9159 lm

Color Temperature: 6509 K

CRI: 88.7

TLCI: 88

TM30: 84.7

CQS: 88.3

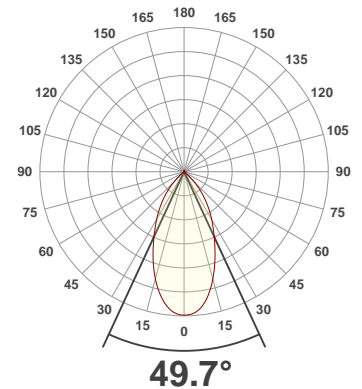
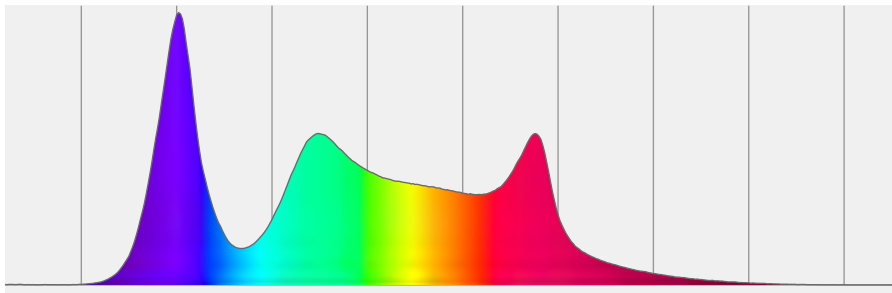
Measurement Date: 3/10/2020

Voltage: 112 V, Current: 1.75 A

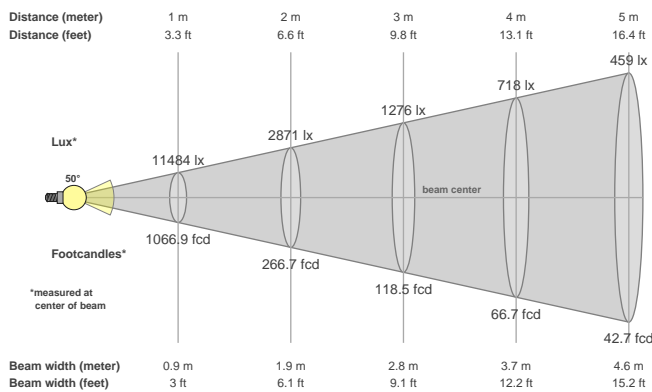
Power: 192.5 W

Efficacy: 48 Lumen/Watt

Spectral distribution
Dominant Wavelength 360



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.7°	89.8°	101.3°

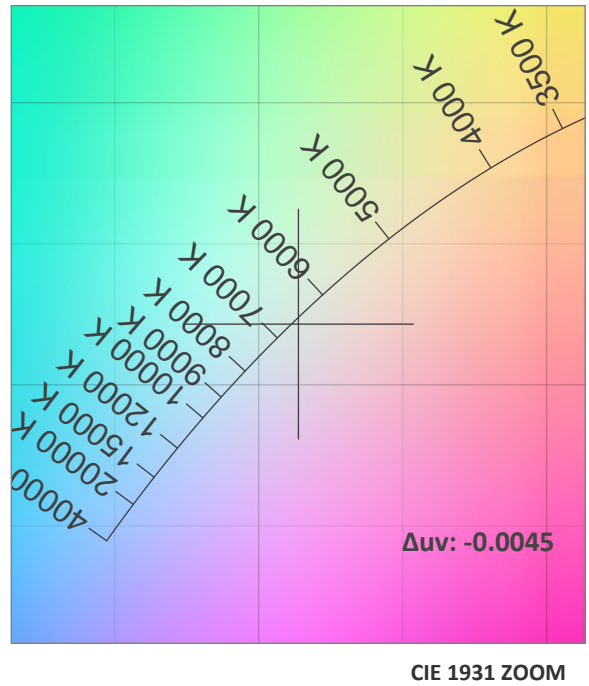
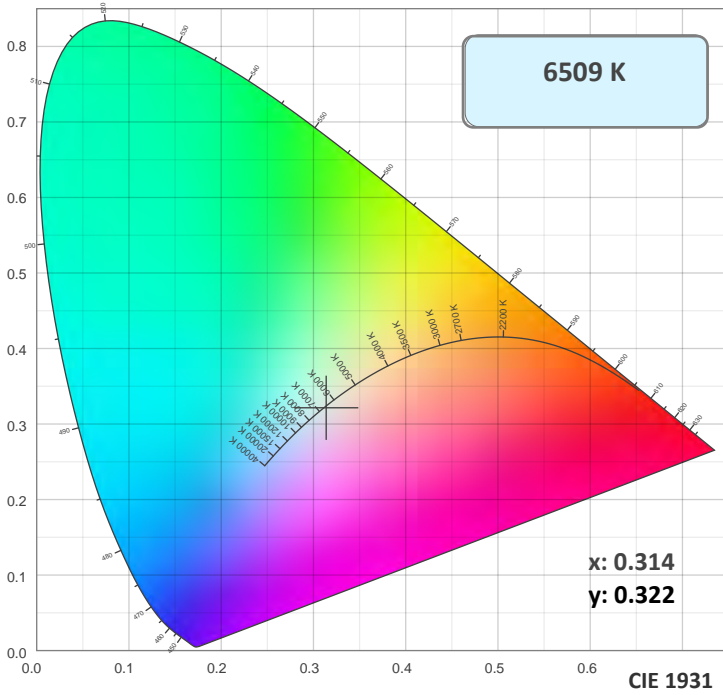
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
11494 cd	99.7%	95.6%

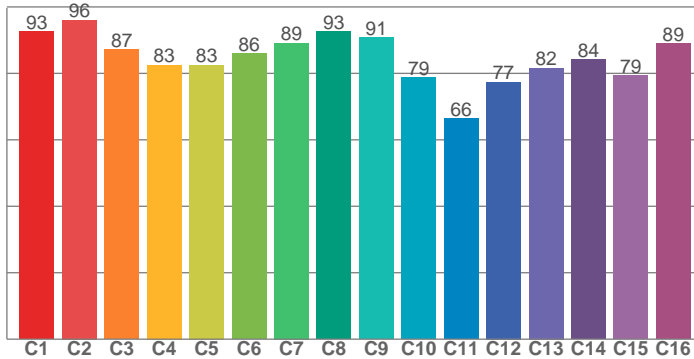
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	11484	2871	1276	718	459	319	234	179	142	115	95	80	68	59	51	45	40	35	32	29
FC	1066.9	266.7	118.5	66.7	42.7	29.6	21.8	16.7	13.2	10.7	8.8	7.4	6.3	5.4	4.7	4.2	3.7	3.3	3	2.7

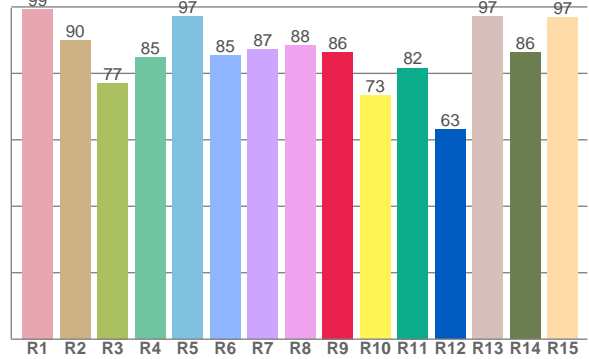
Color Details



TM30: 84.7



CRI: 88.7 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
99.3	89.9	77.1	84.7	97.1	85.5	87.3	88.3	86.4	73.3	81.6	63.1	97.2	86.3	96.7

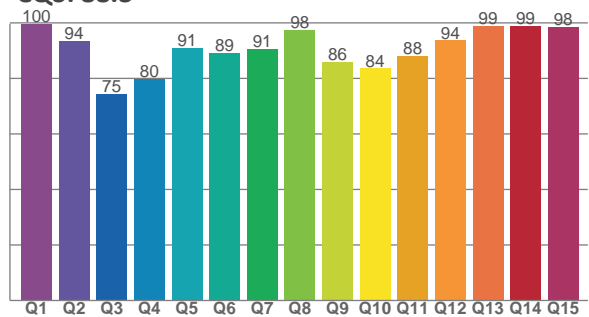
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
92.7	96.1	87.1	82.5	82.5	85.9	89.2	92.6	90.9	78.8	66.3	77.4	81.6	84.2	79.4	89.0

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.5	93.6	74.5	79.7	91.1	89.2	90.7	97.6	86.0	83.6	88.2	93.7	98.8	98.9	98.4

CQS: 88.3



Color Parameters

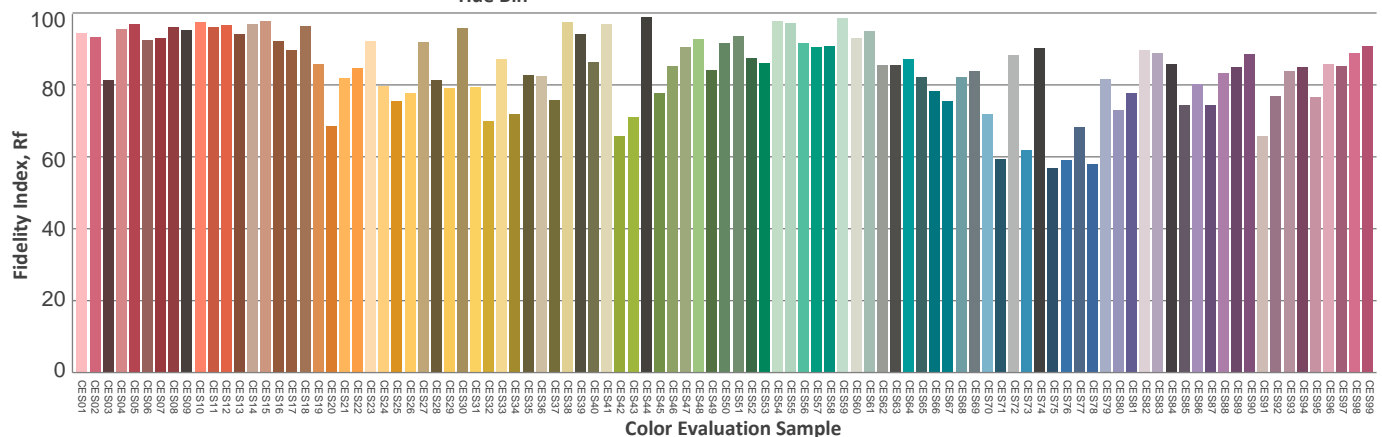
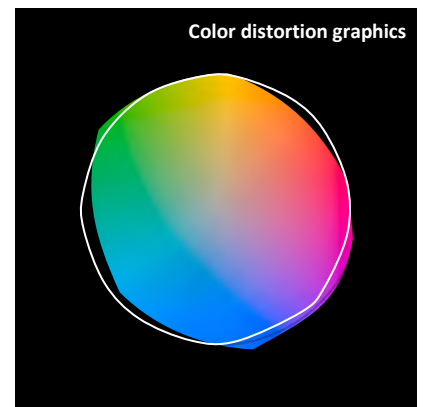
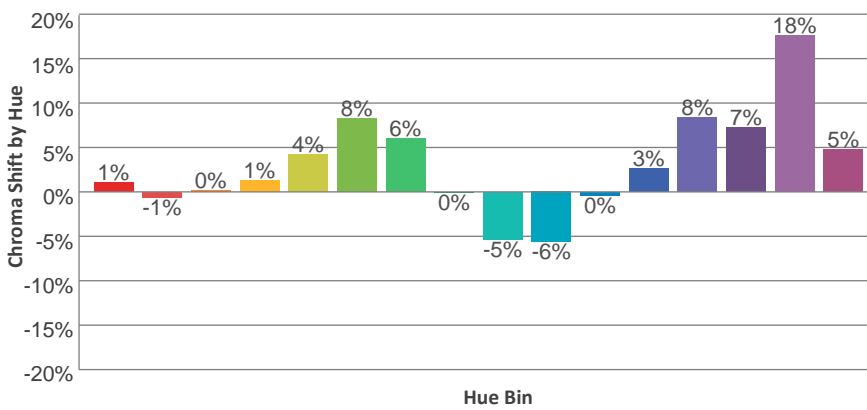
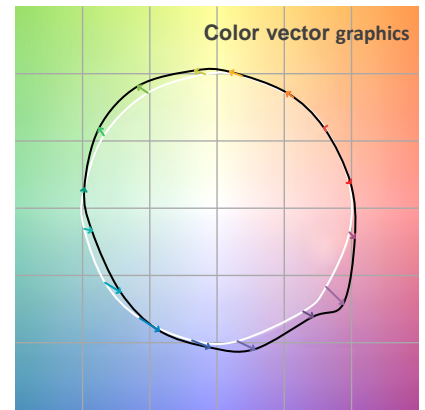
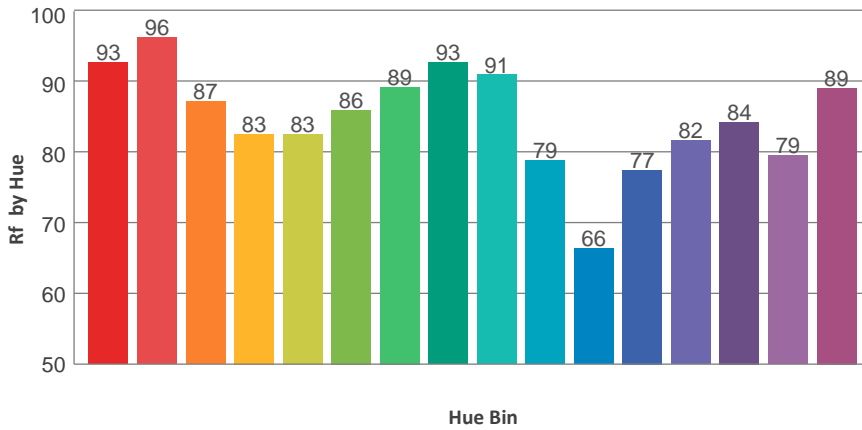
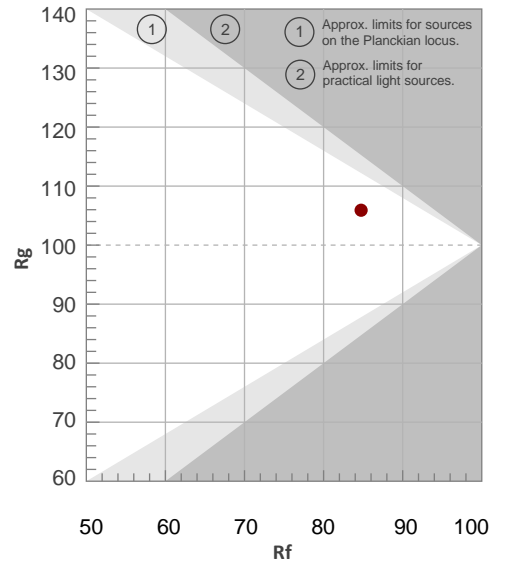
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
6509 K	88.7	86.4	84.7	105.9	88.3	0.314	0.322	0.201	0.310	-0.0045

TM30 Details

Rf 84.7
Fidelity Index Rf

Rg 105.9
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	93	1%	-2%
2	96	-1%	1%
3	87	0%	6%
4	83	1%	9%
5	83	4%	7%
6	86	8%	3%
7	89	6%	-3%
8	93	0%	-3%
9	91	-5%	2%
10	79	-6%	12%
11	66	0%	17%
12	77	3%	14%
13	82	8%	11%
14	84	7%	4%
15	79	18%	-3%
16	89	5%	-3%



Total Lumen Output: 9159 lm

Color Temperature: 6509 K

CRI: 88.7

TLCI: 88

TM30: 84.7

CQS: 88.3

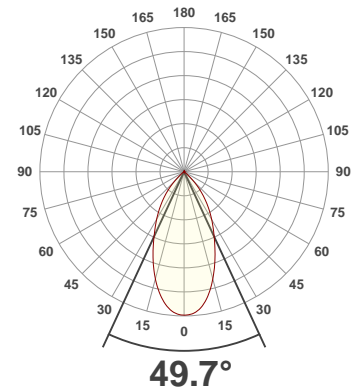
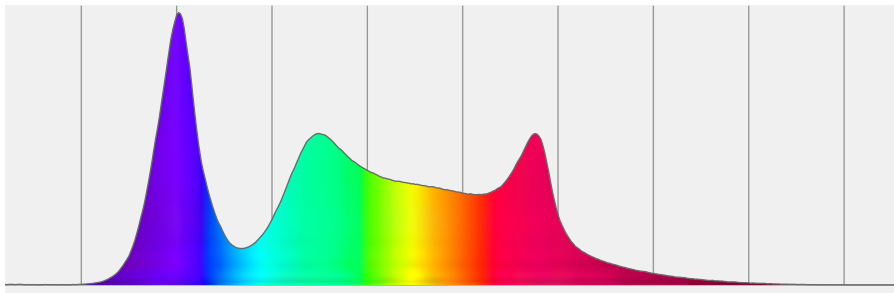
Measurement Date: 3/10/2020

Voltage: 112 V, Current: 1.75 A

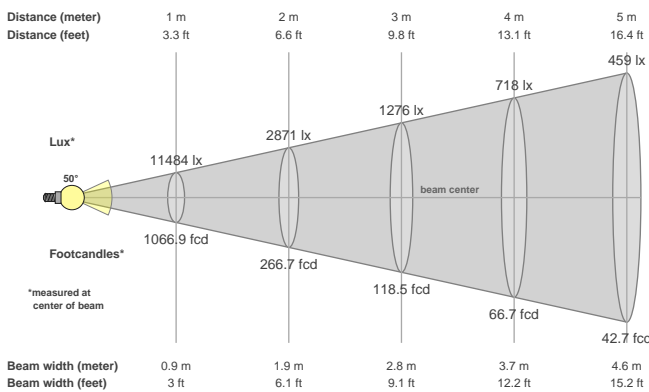
Power: 192.5 W

Efficacy: 48 Lumen/Watt

Spectral distribution
Dominant Wavelength 360



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.7°	89.8°	101.3°

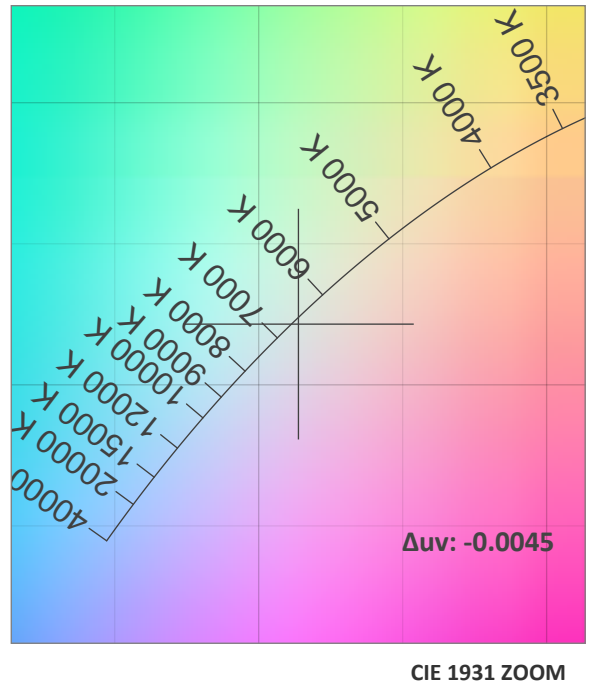
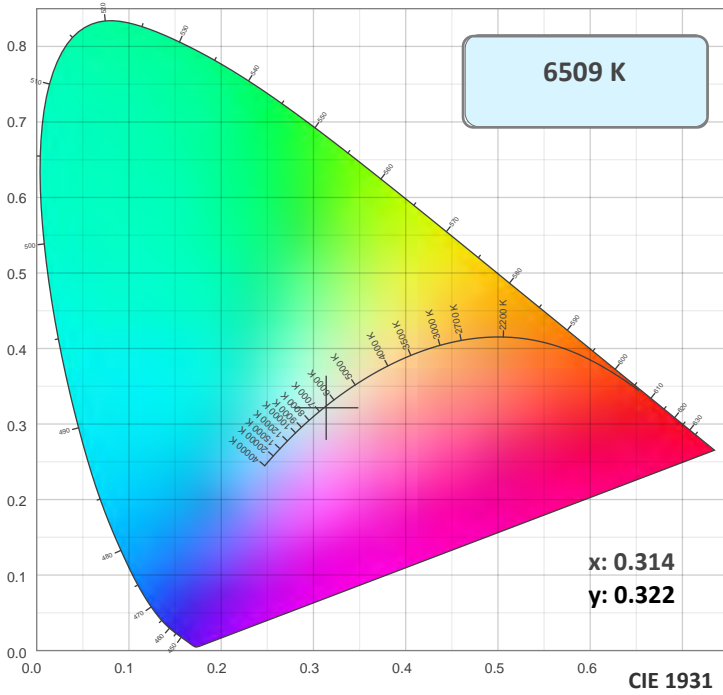
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
11494 cd	99.7%	95.6%

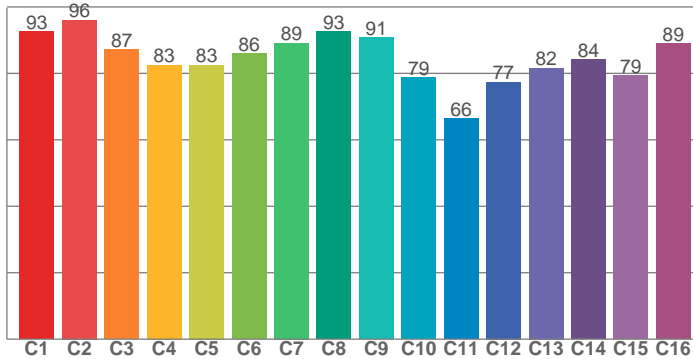
Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	11484	2871	1276	718	459	319	234	179	142	115	95	80	68	59	51	45	40	35	32	29
FC	1066.9	266.7	118.5	66.7	42.7	29.6	21.8	16.7	13.2	10.7	8.8	7.4	6.3	5.4	4.7	4.2	3.7	3.3	3	2.7

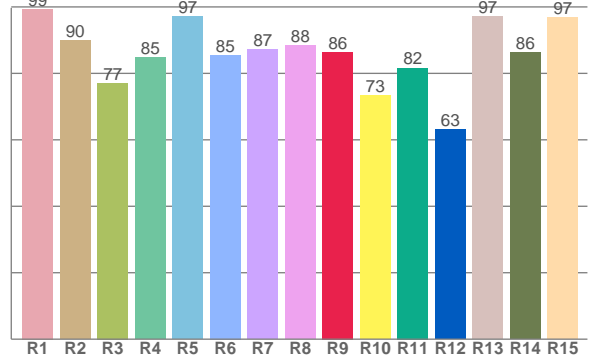
Color Details



TM30: 84.7



CRI: 88.7 (R1-R8)



CRI R values, only R1-R8 are used to calculate final CRI value

R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12	R13	R14	R15
99.3	89.9	77.1	84.7	97.1	85.5	87.3	88.3	86.4	73.3	81.6	63.1	97.2	86.3	96.7

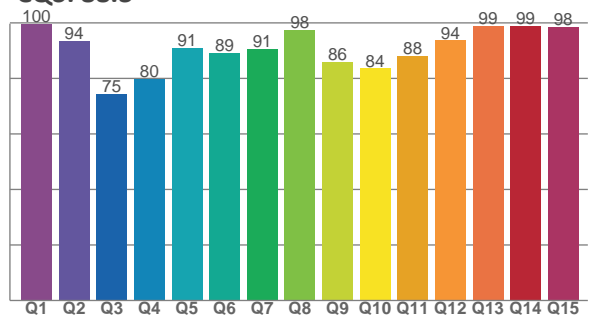
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
92.7	96.1	87.1	82.5	82.5	85.9	89.2	92.6	90.9	78.8	66.3	77.4	81.6	84.2	79.4	89.0

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.5	93.6	74.5	79.7	91.1	89.2	90.7	97.6	86.0	83.6	88.2	93.7	98.8	98.9	98.4

CQS: 88.3



Color Parameters

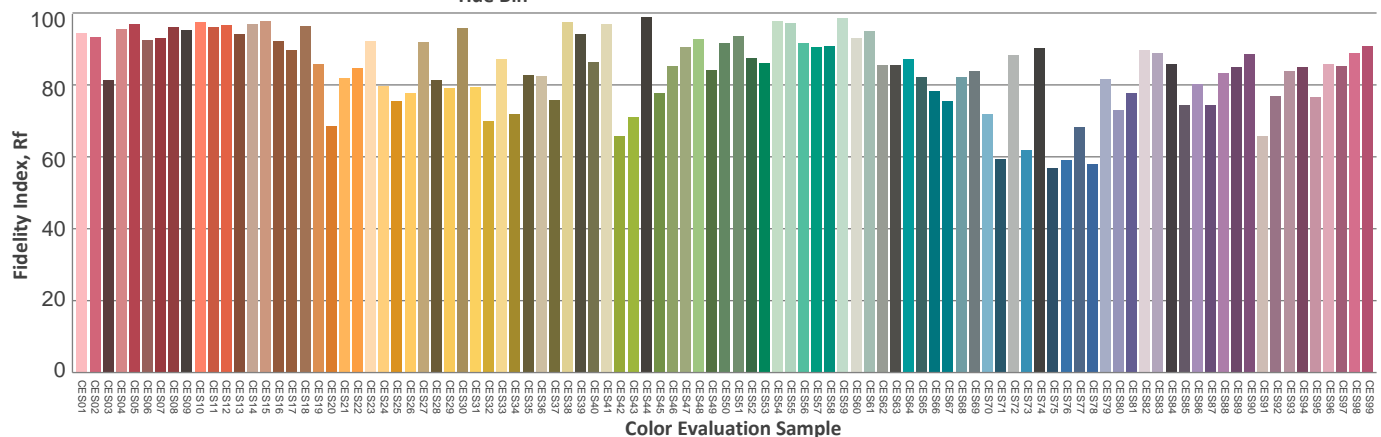
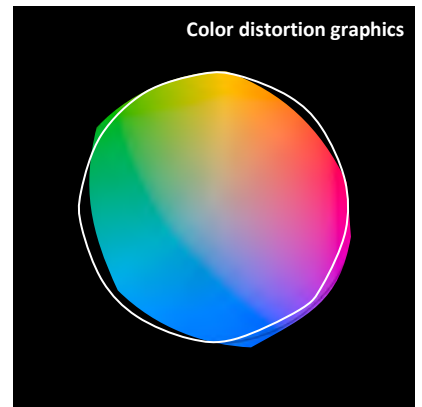
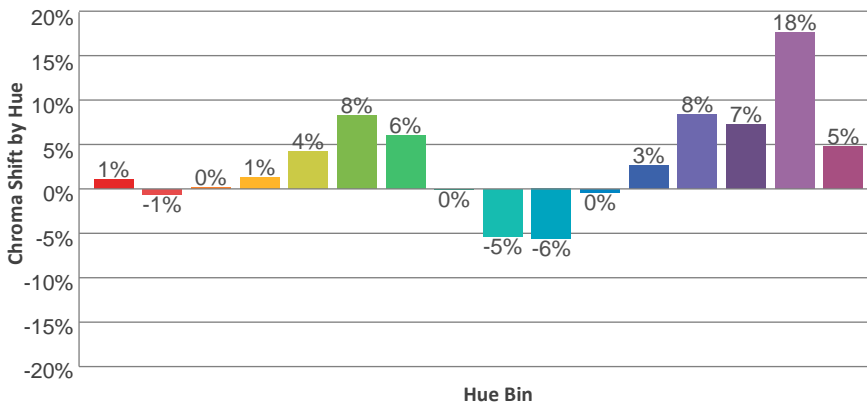
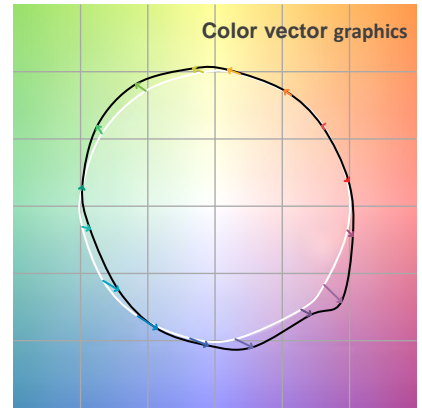
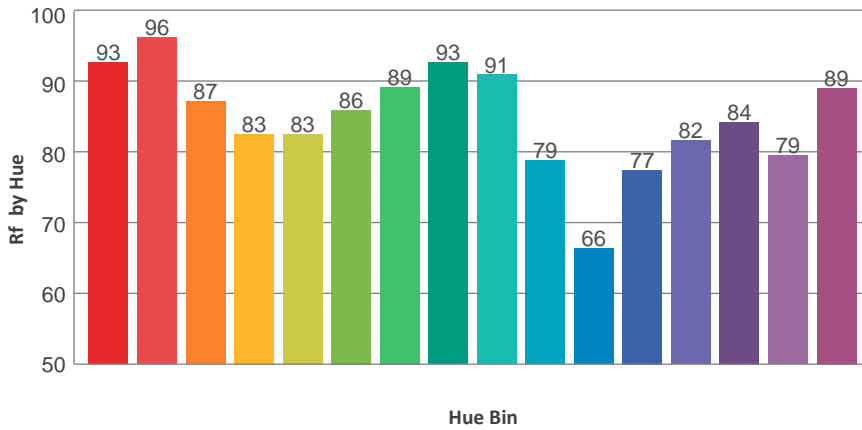
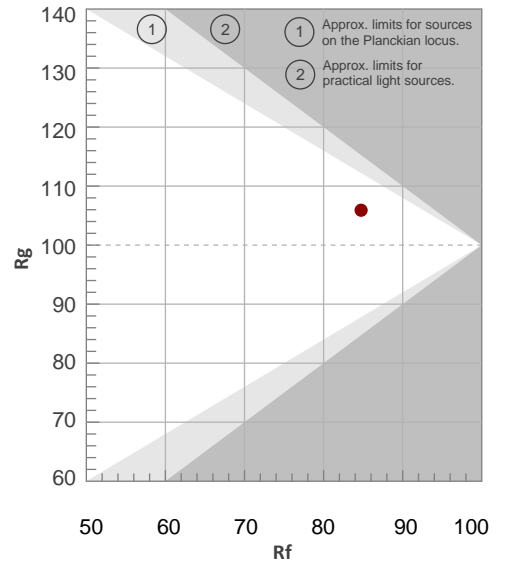
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
6509 K	88.7	86.4	84.7	105.9	88.3	0.314	0.322	0.201	0.310	-0.0045

TM30 Details

Rf 84.7
Fidelity Index Rf

Rg 105.9
Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	93	1%	-2%
2	96	-1%	1%
3	87	0%	6%
4	83	1%	9%
5	83	4%	7%
6	86	8%	3%
7	89	6%	-3%
8	93	0%	-3%
9	91	-5%	2%
10	79	-6%	12%
11	66	0%	17%
12	77	3%	14%
13	82	8%	11%
14	84	7%	4%
15	79	18%	-3%
16	89	5%	-3%



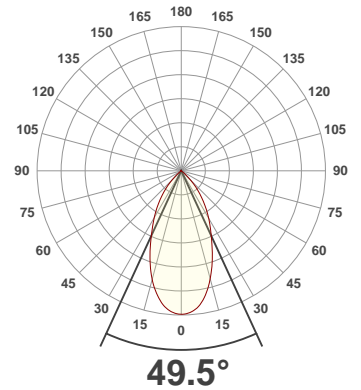
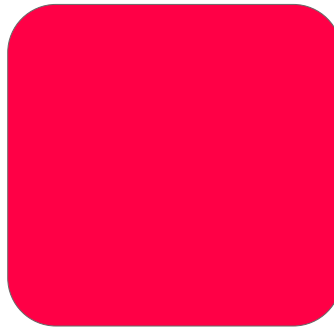
Total Lumen Output: 1198 lm

Voltage: 114 V, Current: 0.366 A

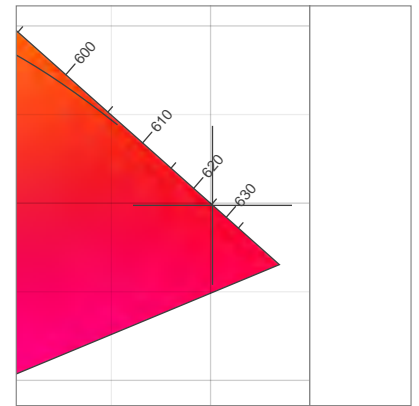
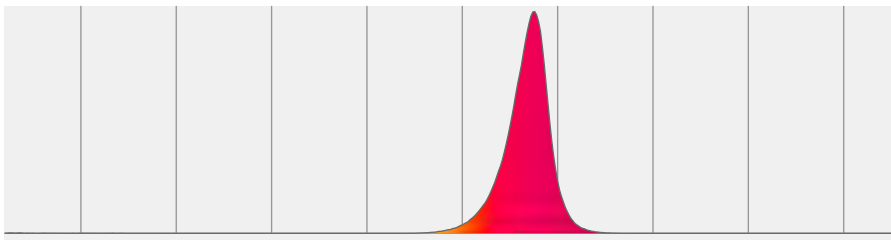
Power: 35.6 W

Efficacy: 34 Lumen/Watt

Measurement Date: 3/10/2020

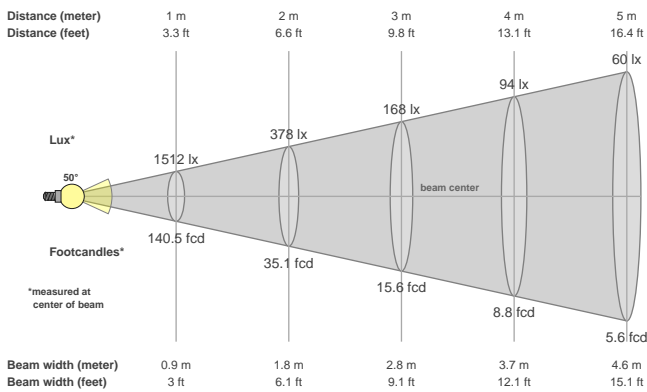


Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
625	0.701	0.299	0.541	0.346

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.5°	89.2°	100.6°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
1513 cd	99.5%	95.7%

Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	1512	378	168	94	60	42	31	24	19	15	12	10	9	8	7	6	5	5	4	4
FC	140.5	35.1	15.6	8.8	5.6	3.9	2.9	2.2	1.7	1.4	1.2	1	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.4

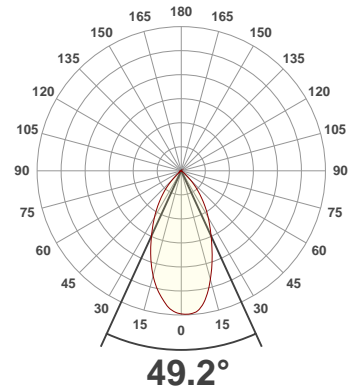
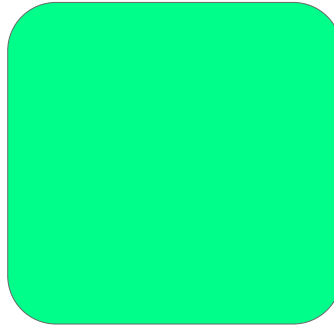
Total Lumen Output: 1942 lm

Voltage: 113 V, Current: 0.452 A

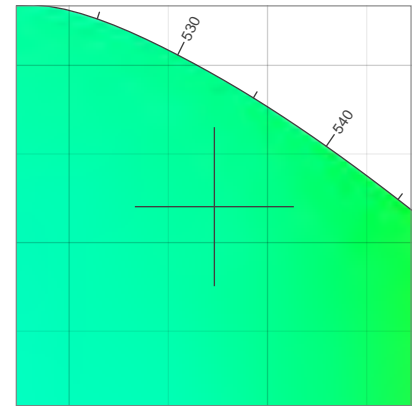
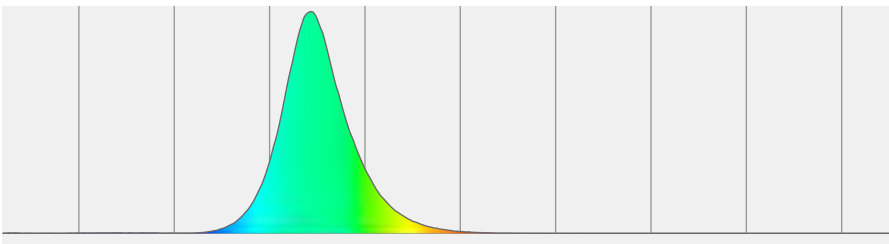
Power: 46.4 W

Efficacy: 42 Lumen/Watt

Measurement Date: 3/10/2020

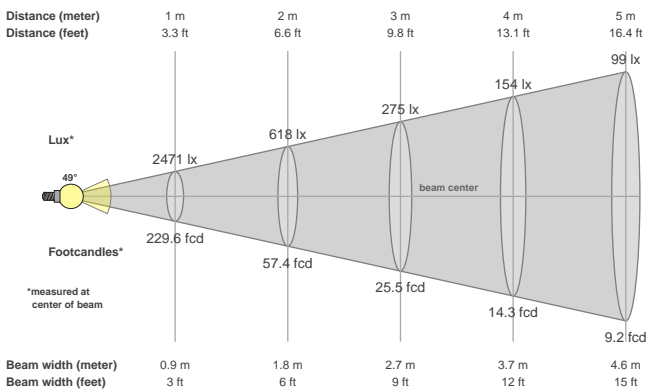


Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
528	0.173	0.720	0.061	0.383

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
49.2°	89°	101°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
2478 cd	99.4%	95.4%

Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	2471	618	275	154	99	69	50	39	31	25	20	17	15	13	11	10	9	8	7	6
FC	229.6	57.4	25.5	14.3	9.2	6.4	4.7	3.6	2.8	2.3	1.9	1.6	1.4	1.2	1	0.9	0.8	0.7	0.6	0.6

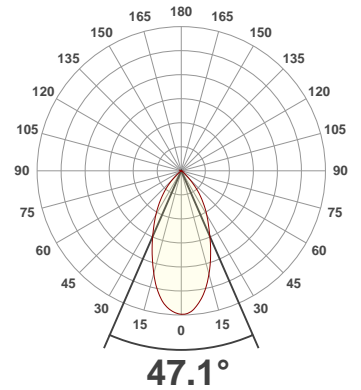
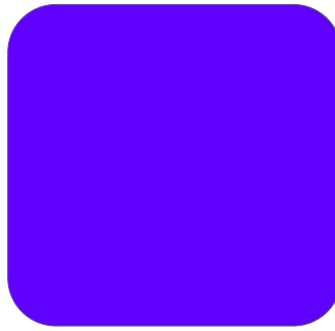
Total Lumen Output: 384 lm

Voltage: 114 V, Current: 0.423 A

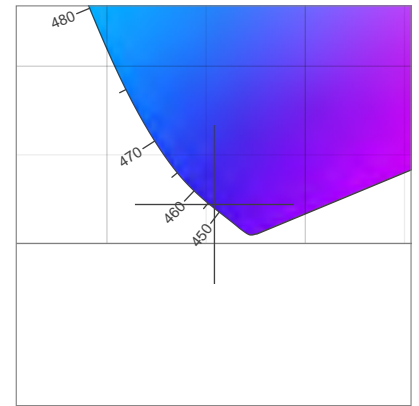
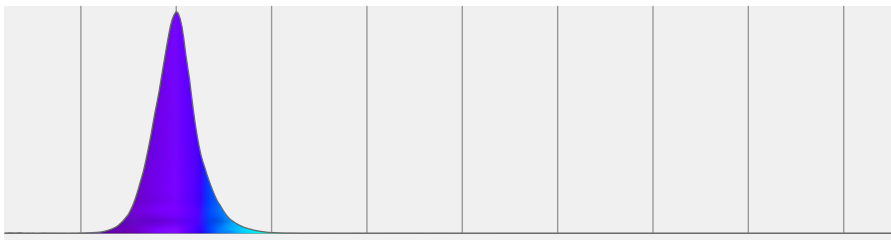
Power: 42.9 W

Efficacy: 9 Lumen/Watt

Measurement Date: 3/10/2020

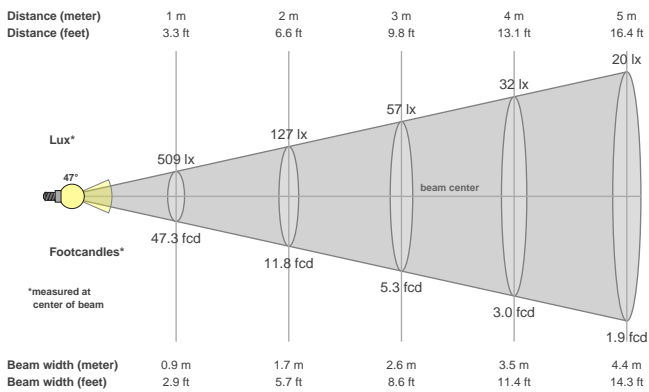


Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
453	0.154	0.022	0.209	0.045

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
47.1°	88.2°	100.3°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
509 cd	98.9%	94.9%

Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	509	127	57	32	20	14	10	8	6	5	4	4	3	3	2	2	2	2	1	1
FC	47.3	11.8	5.3	3	1.9	1.3	1	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1

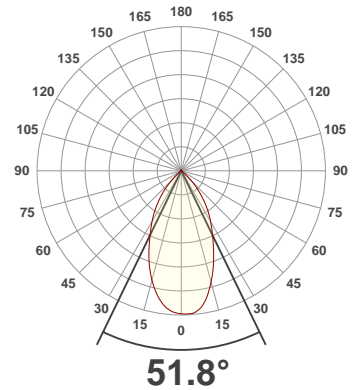
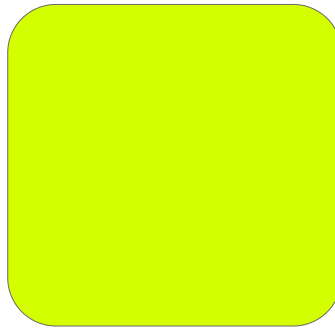
Total Lumen Output: 3224 lm

Voltage: 114 V, Current: 0.476 A

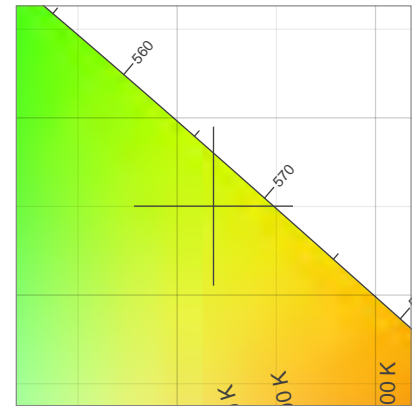
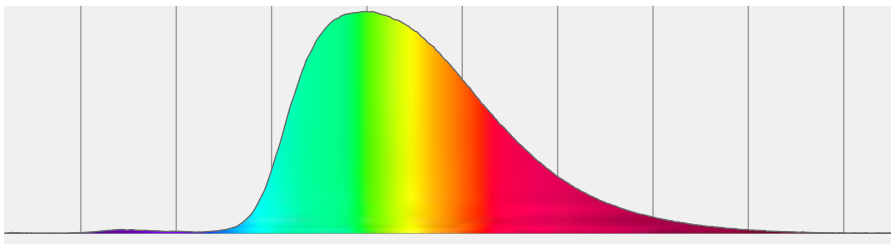
Power: 50.0 W

Efficacy: 65 Lumen/Watt

Measurement Date: 3/10/2020

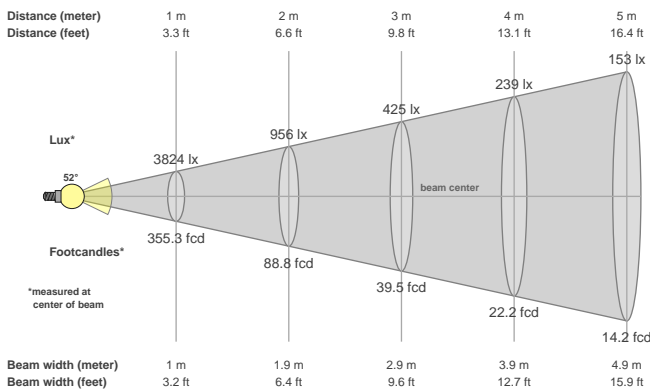


Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
568	0.418	0.550	0.191	0.377

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
51.8°	90.6°	102.3°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
3836 cd	99.3%	94.9%

Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	3824	956	425	239	153	106	78	60	47	38	32	27	23	20	17	15	13	12	11	10
FC	355.3	88.8	39.5	22.2	14.2	9.9	7.3	5.6	4.4	3.6	2.9	2.5	2.1	1.8	1.6	1.4	1.2	1.1	1	0.9

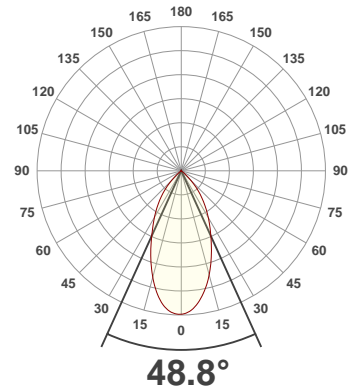
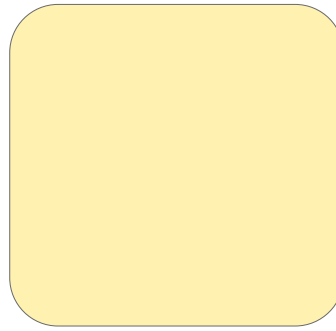
Total Lumen Output: 4401 lm

Voltage: 114 V, Current: 0.754 A

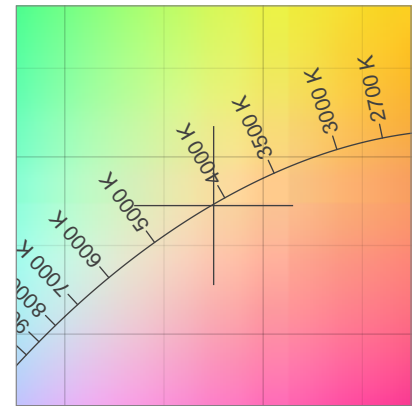
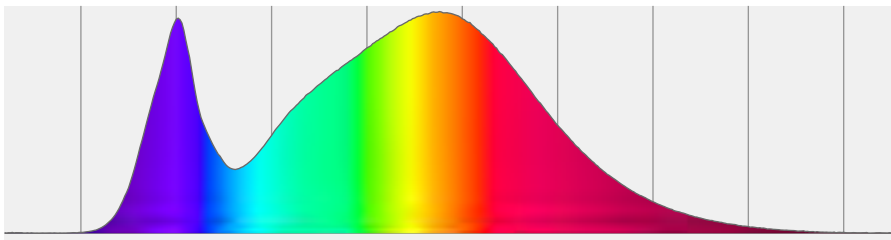
Power: 82.5 W

Efficacy: 53 Lumen/Watt

Measurement Date: 3/10/2020

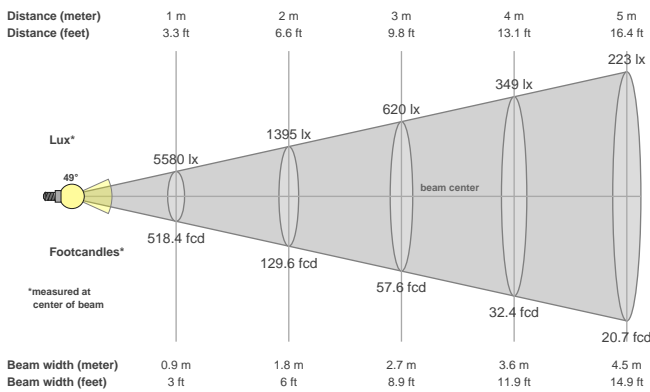


Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
582	0.375	0.373	0.223	0.333

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
48.8°	89.7°	101.3°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
5588 cd	99.3%	95.2%

Beam Intensities from 1-20m

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	5580	1395	620	349	223	155	114	87	69	56	46	39	33	28	25	22	19	17	15	14
FC	518.4	129.6	57.6	32.4	20.7	14.4	10.6	8.1	6.4	5.2	4.3	3.6	3.1	2.6	2.3	2	1.8	1.6	1.4	1.3