



FUZE PENDANT™

Photometric Test Report

25° Lens

74° 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: 9082 lm

Voltage: 111 V, Current: 2.25 A

Color Temperature: 7203 K

Power: 246.2 W

CRI: 72.3

Efficacy: 37 Lumen/Watt

TLCI: 80

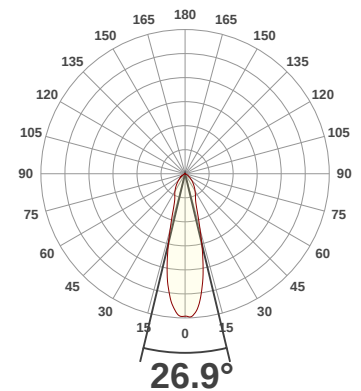
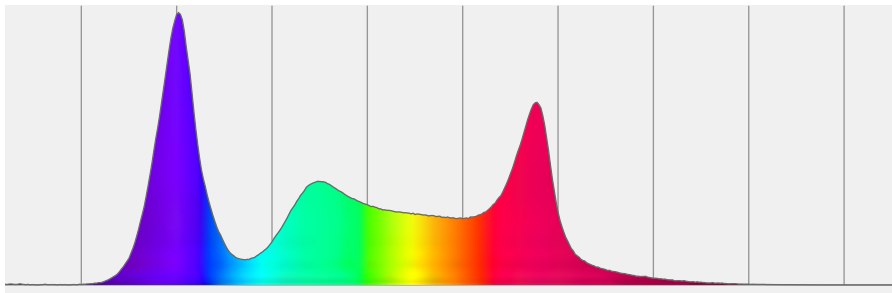
TM30: 74.5

CQS: 83.7

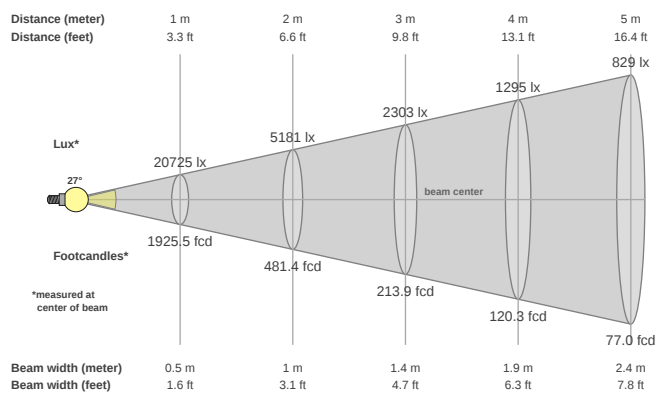
Measurement Date: 3/11/2020

Spectral distribution

Dominant Wavelength 360



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
26.9°	74.6°	114.4°

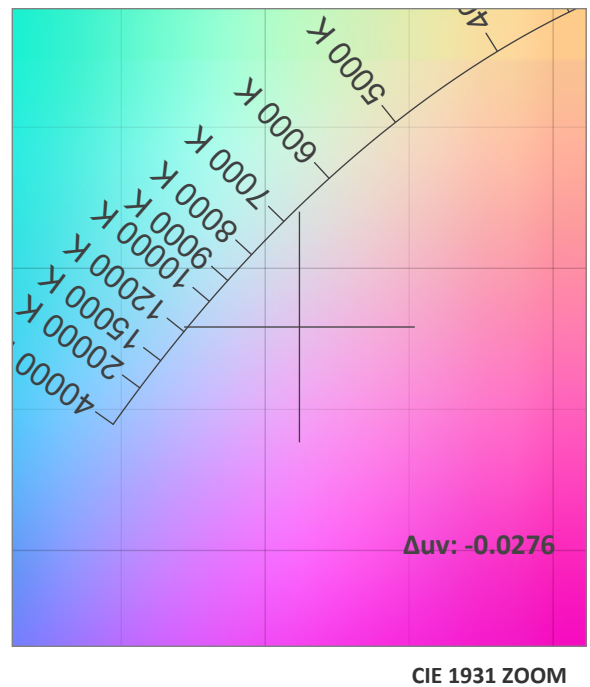
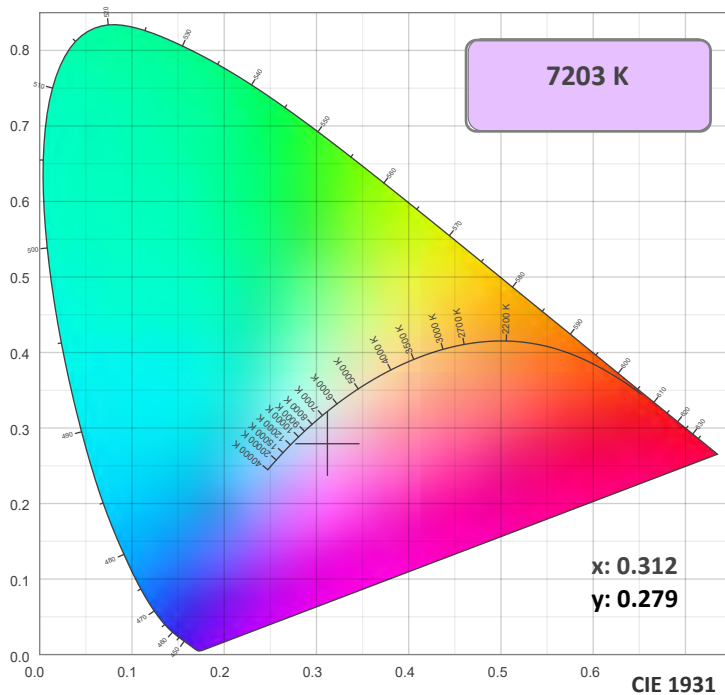
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
20839 cd	97.3%	85.8%

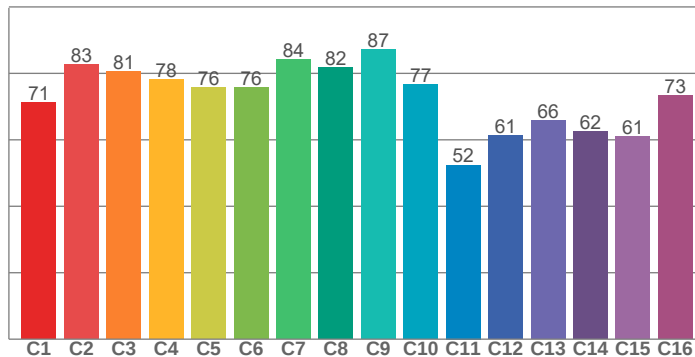
Beam Intensities from 1-20m

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	20725	5181	2303	1295	829	576	423	324	256	207	171	144	123	106	92	81	72	64	57	52
FC	1925.5	481.4	213.9	120.3	77	53.5	39.3	30.1	23.8	19.3	15.9	13.4	11.4	9.8	8.6	7.5	6.7	5.9	5.3	4.8

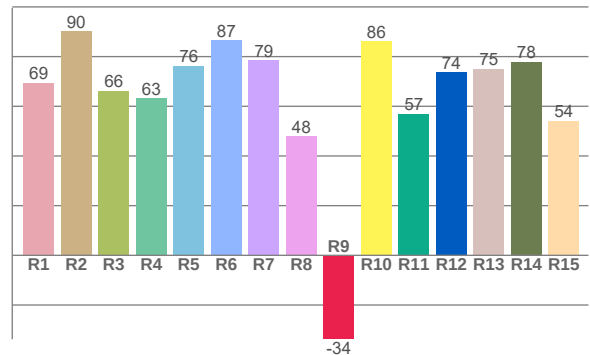
Color Details



TM30: 74.5



CRI: 72.3 (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
69.4	90.2	66.2	63.2	76.3	86.5	78.5	47.9	-33.8	86.1	57.0	73.6	75.1	77.9	54.1

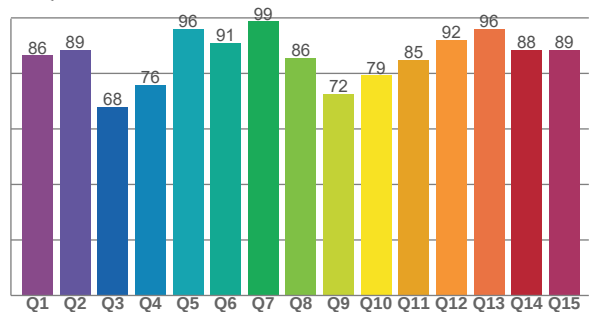
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
71.3	82.6	80.6	78.2	75.8	75.8	84.2	81.8	87.1	76.6	52.4	61.2	65.7	62.4	61.0	73.4

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
86.5	88.5	68.0	76.0	96.0	91.1	98.7	85.5	72.5	79.2	84.8	92.1	95.9	88.5	88.6

CQS: 83.7



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
7203 K	72.3	-33.8	74.5	117.3	83.7	0.312	0.279	0.218	0.293	-0.0276

TM30 Details

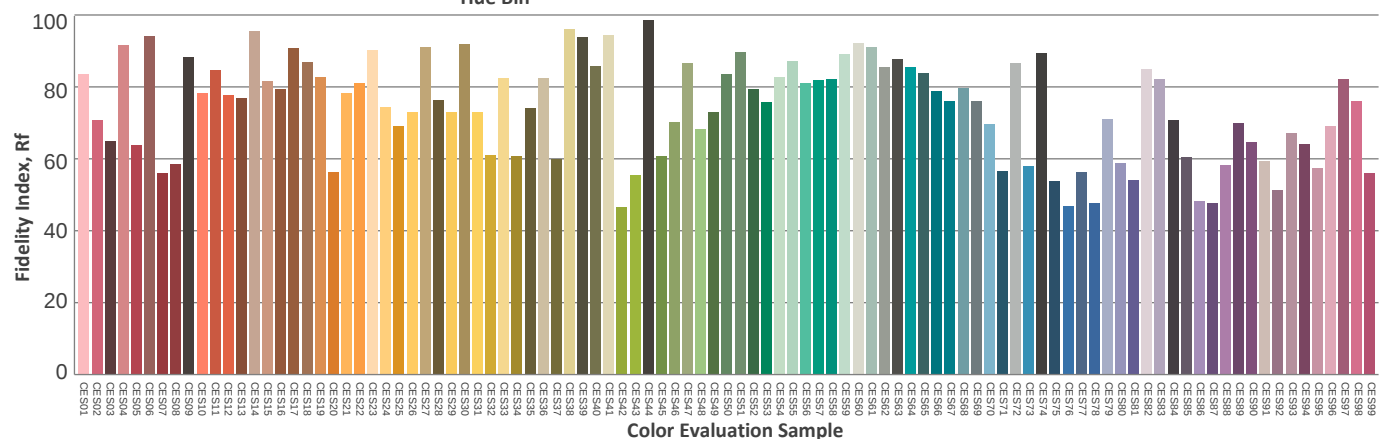
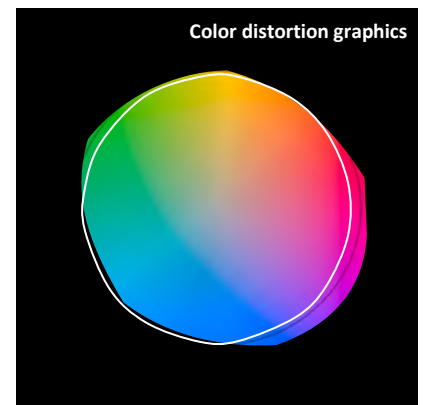
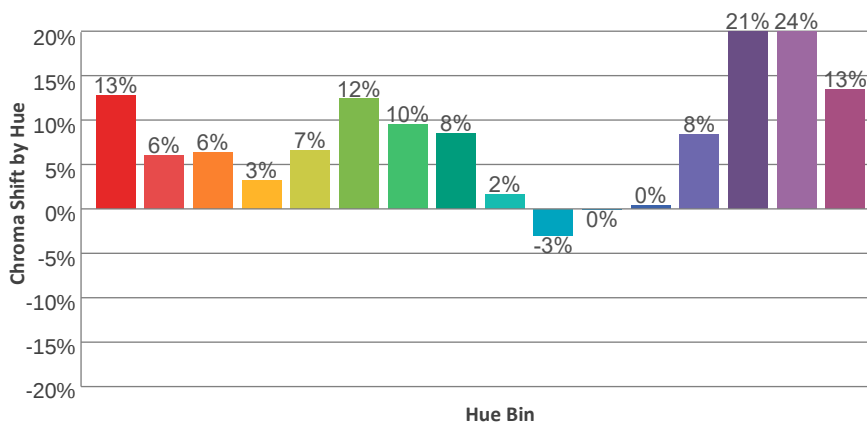
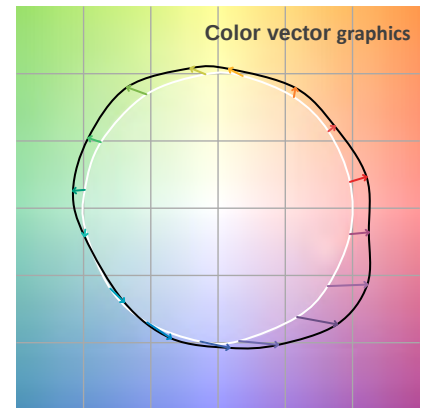
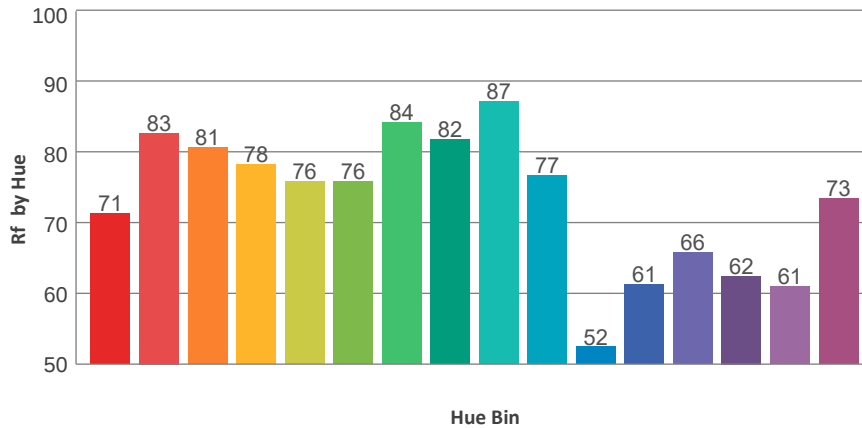
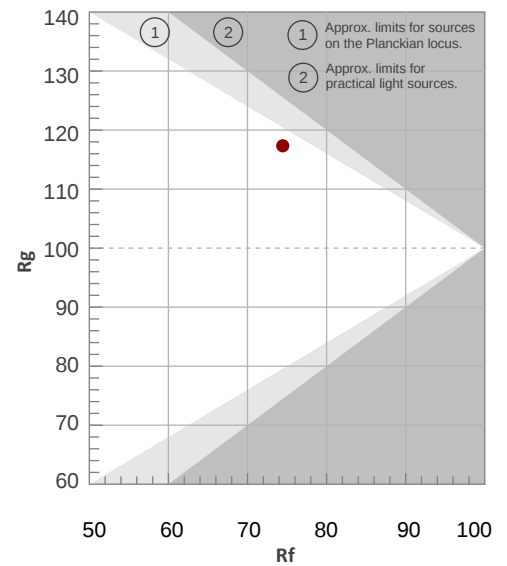
Rf 74.5

Fidelity Index Rf

Rg 117.3

Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	71	13%	1%
2	83	6%	0%
3	81	6%	3%
4	78	3%	11%
5	76	7%	10%
6	76	12%	9%
7	84	10%	3%
8	82	8%	2%
9	87	2%	5%
10	77	-3%	14%
11	52	0%	21%
12	61	0%	22%
13	66	8%	28%
14	62	21%	22%
15	61	24%	17%
16	73	13%	4%



Total Lumen Output: 5786 lm

Color Temperature: 2679 K

CRI: 89.4

TLCI: 85

TM30: 87.8

CQS: 89.3

Measurement Date: 3/11/2020

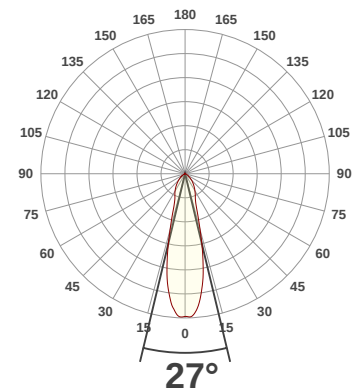
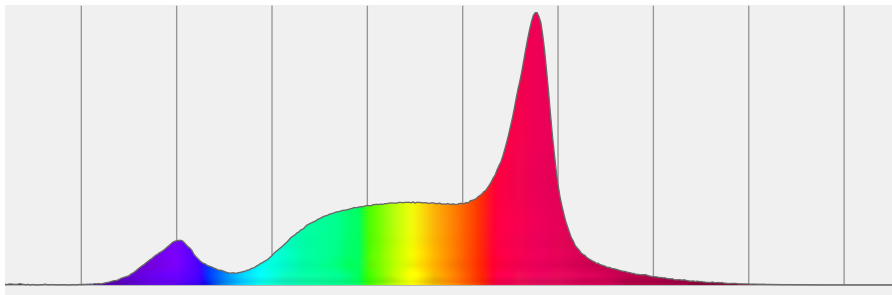
Voltage: 112 V, Current: 1.29 A

Power: 141 W

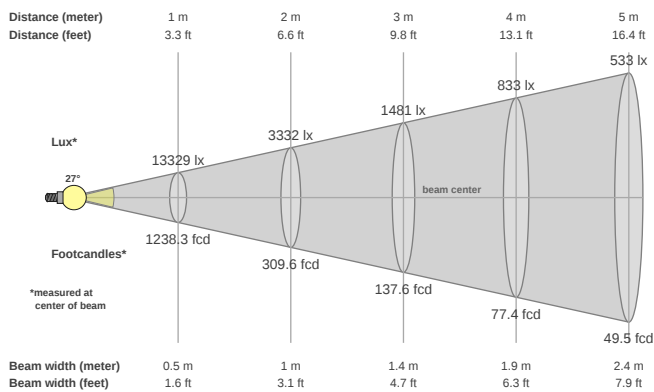
Efficacy: 41 Lumen/Watt

Spectral distribution

Dominant Wavelength 585



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
27°	74.1°	114°

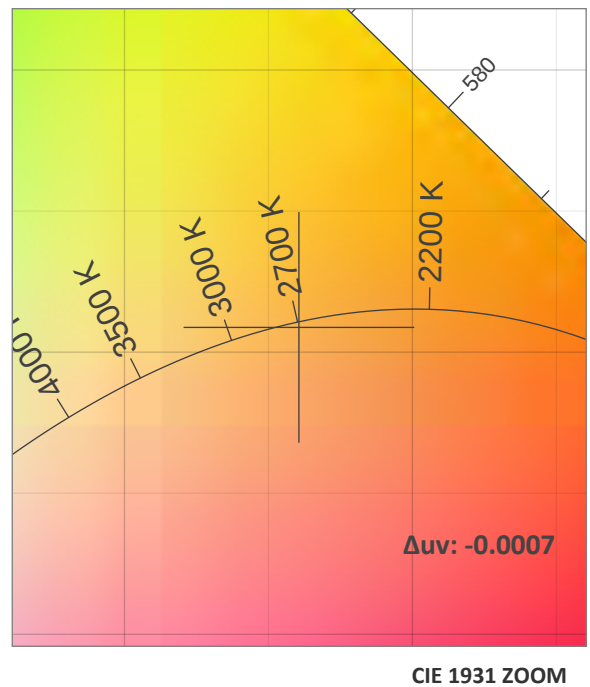
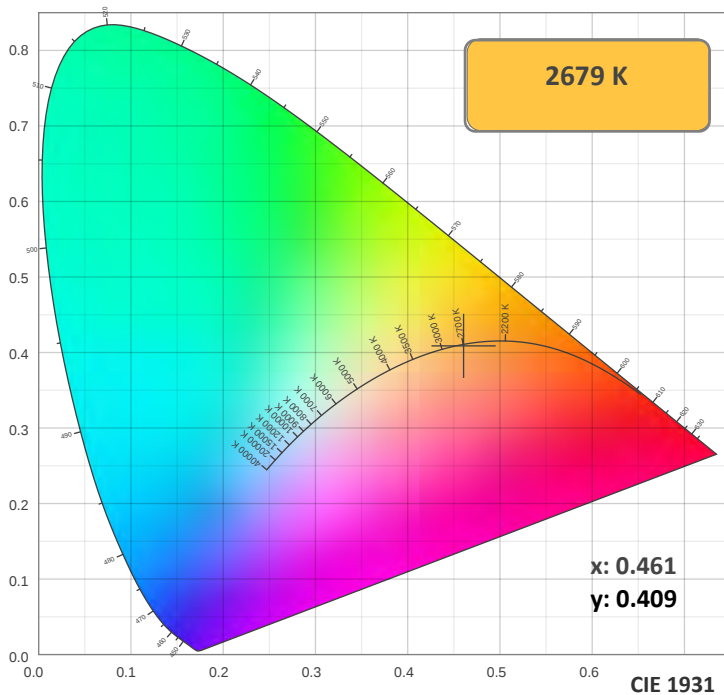
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
13378 cd	97.4%	86.0%

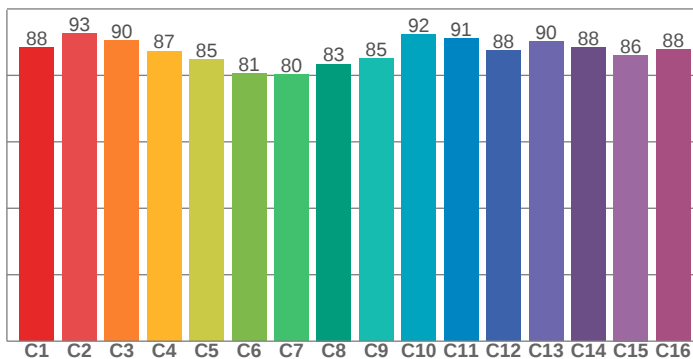
Beam Intensities from 1-20m

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	13329	3332	1481	833	533	370	272	208	165	133	110	93	79	68	59	52	46	41	37	33
FC	1238.3	309.6	137.6	77.4	49.5	34.4	25.3	19.3	15.3	12.4	10.2	8.6	7.3	6.3	5.5	4.8	4.3	3.8	3.4	3.1

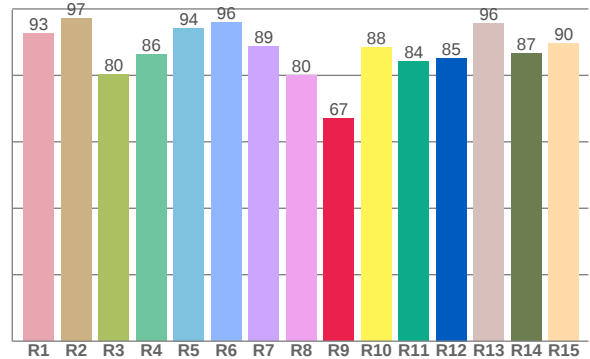
Color Details



TM30: 87.8



CRI: 89.4 (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
92.6	97.3	80.3	86.2	94.3	95.8	88.6	79.9	67.0	88.5	84.2	85.2	95.6	86.5	89.6

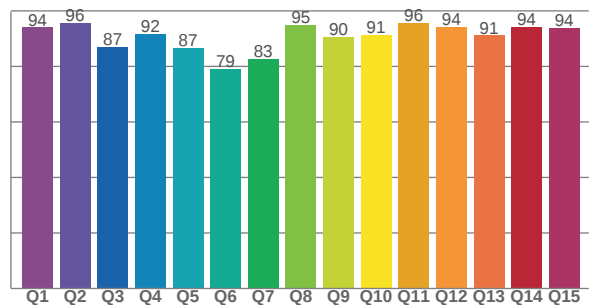
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
88.5	92.5	90.5	87.3	84.8	80.6	80.2	83.4	85.1	92.4	91.1	87.6	90.1	88.5	86.1	87.8

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
94.0	95.7	87.1	91.6	86.7	79.2	82.7	95.0	90.5	91.3	95.8	94.2	91.1	94.1	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 Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
2679 K	89.4	67.0	87.8	109.2	89.3	0.461	0.409	0.264	0.351	-0.0007

TM30 Details

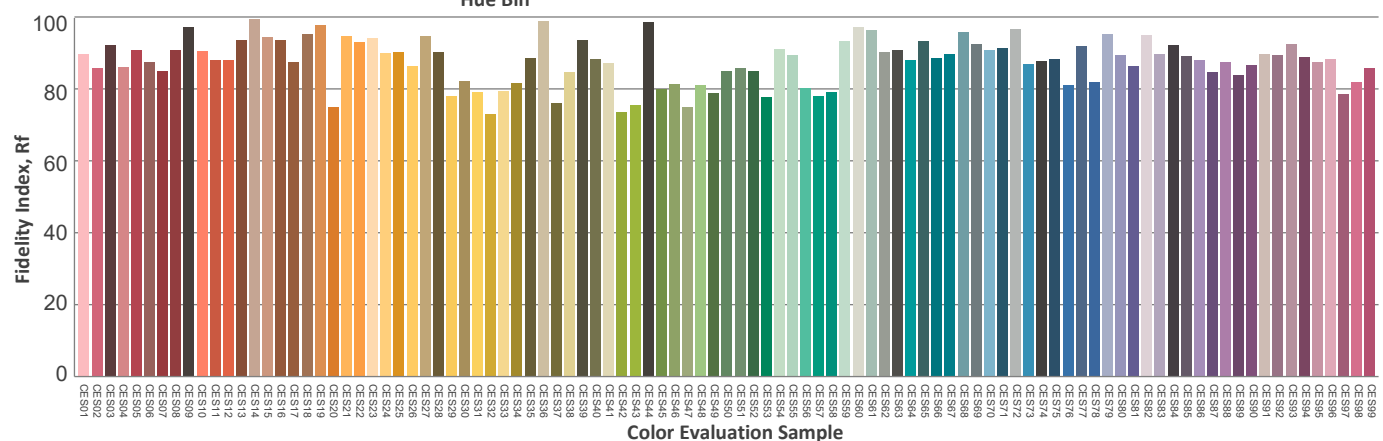
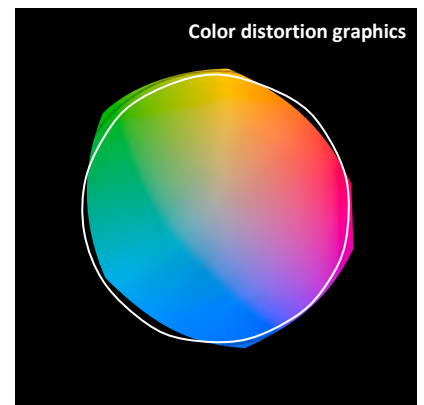
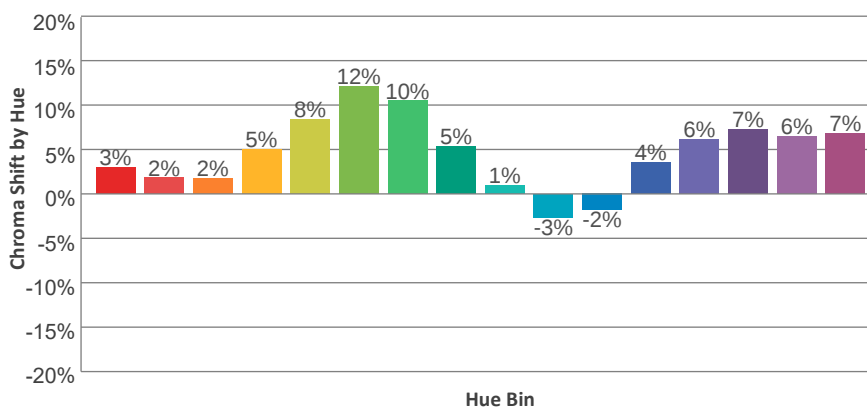
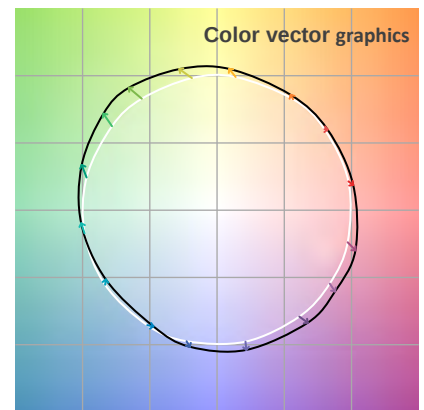
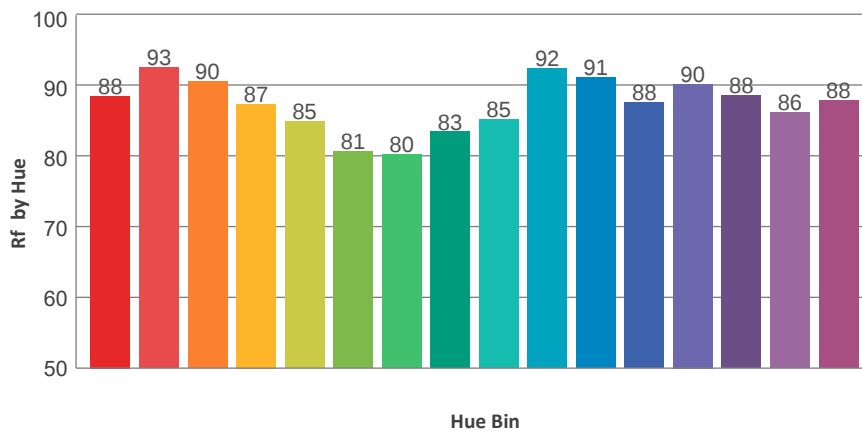
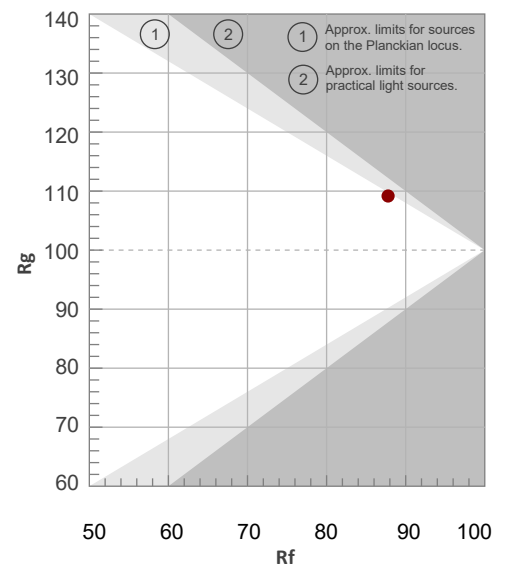
Rf 87.8

Fidelity Index Rf

Rg 109.2

Gamut Index Rg

		Graphic shifts (%)	
Hue Bin	R_f	Chroma	Hue
1	88	3%	-3%
2	93	2%	-2%
3	90	2%	3%
4	87	5%	6%
5	85	8%	8%
6	81	12%	4%
7	80	10%	-4%
8	83	5%	-8%
9	85	1%	-8%
10	92	-3%	-3%
11	91	-2%	4%
12	88	4%	3%
13	90	6%	-1%
14	88	7%	3%
15	86	6%	-3%
16	88	7%	-5%



Total Lumen Output: 7526 lm

Color Temperature: 3250 K

CRI: 89.9

TLCI: 85

TM30: 88.1

CQS: 90.7

Measurement Date: 3/11/2020

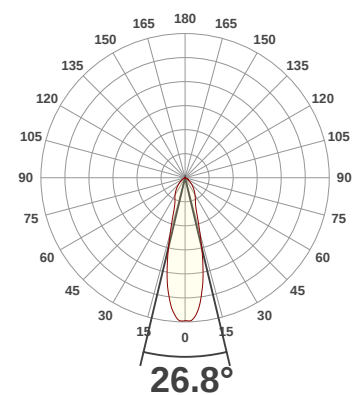
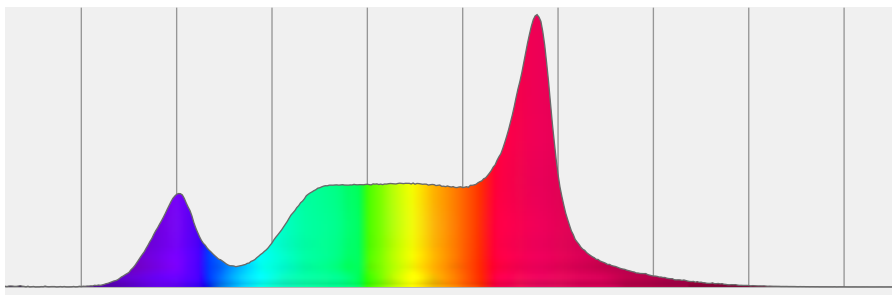
Voltage: 112 V, Current: 1.57 A

Power: 171.7 W

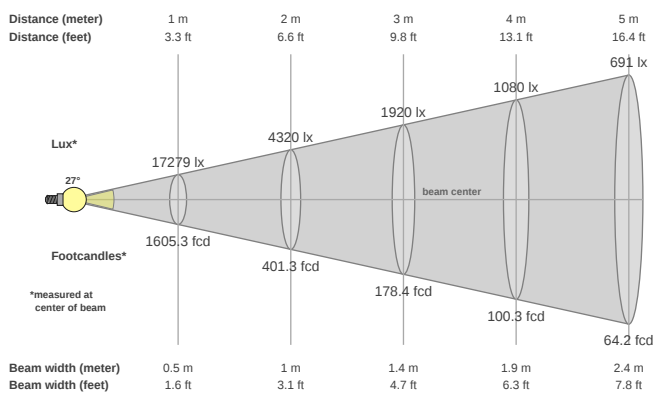
Efficacy: 44 Lumen/Watt

Spectral distribution

Dominant Wavelength 584



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
26.8°	74.4°	114.7°

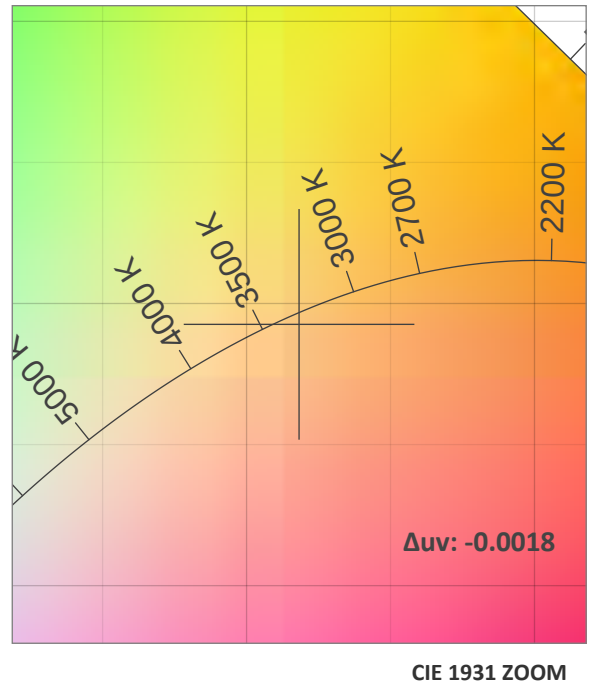
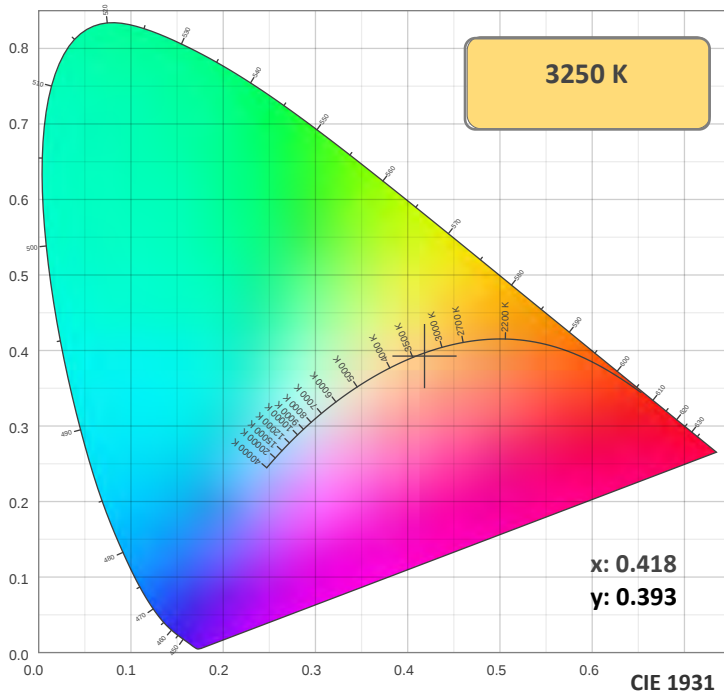
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
17313 cd	97.1%	85.5%

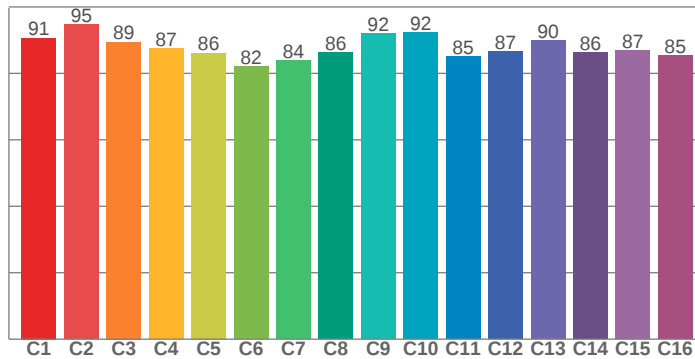
Beam Intensities from 1-20m

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	17279	4320	1920	1080	691	480	353	270	213	173	143	120	102	88	77	67	60	53	48	43
FC	1605.3	401.3	178.4	100.3	64.2	44.6	32.8	25.1	19.8	16.1	13.3	11.1	9.5	8.2	7.1	6.3	5.6	5	4.4	4

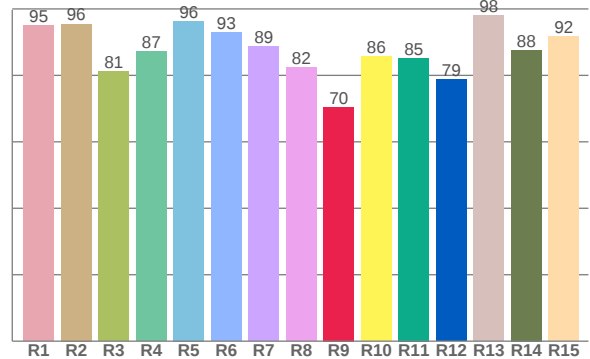
Color Details



TM30: 88.1



CRI: 89.9 (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
95.0	95.5	81.2	87.2	96.4	93.0	88.6	82.5	70.5	85.6	85.2	78.7	97.9	87.6	91.8

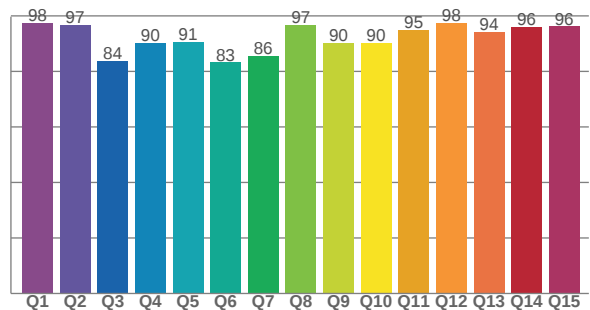
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.6	94.7	89.5	87.4	86.1	82.0	83.9	86.2	92.0	92.2	85.0	86.6	90.0	86.4	86.9	85.4

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
97.6	96.8	83.7	90.4	90.7	83.2	85.5	96.8	90.4	90.4	95.0	97.5	94.3	96.1	96.2

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
3250 K	89.9	70.5	88.1	108.4	90.7	0.418	0.393	0.243	0.343	-0.0018

TM30 Details

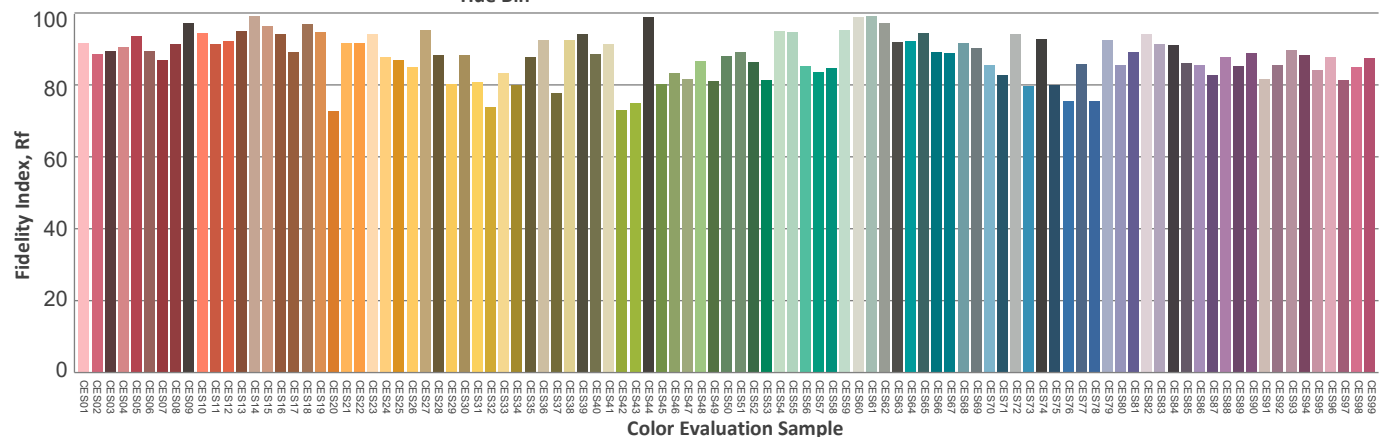
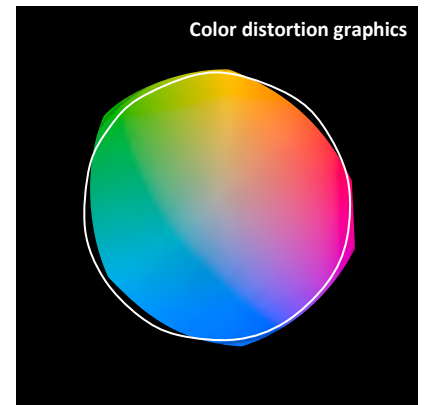
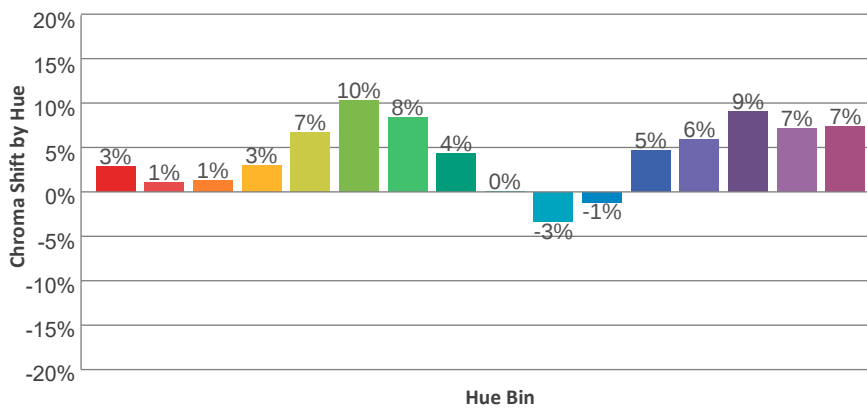
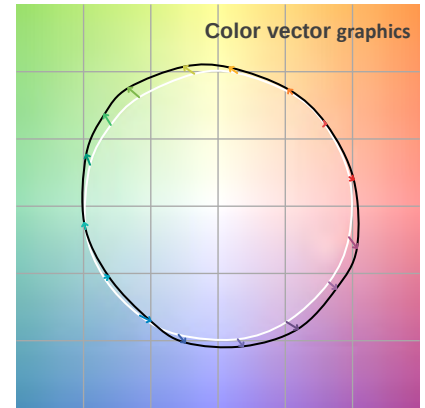
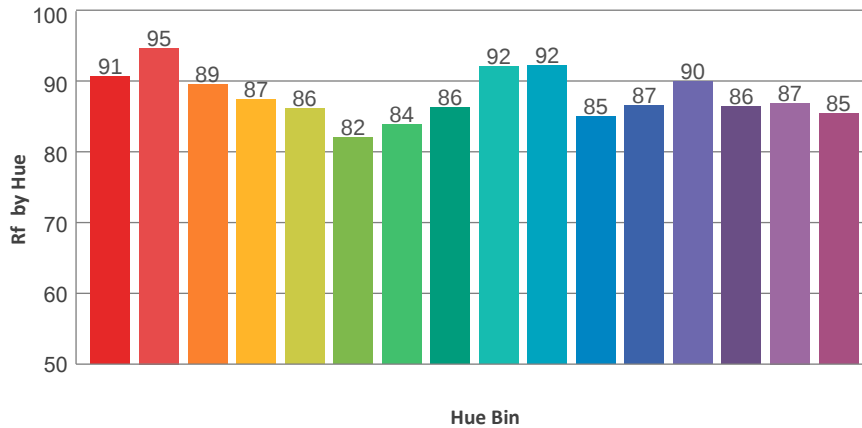
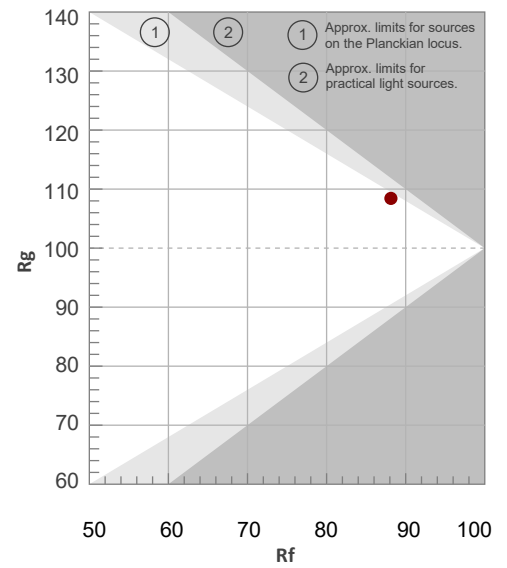
Rf 88.1

Fidelity Index Rf

Rg 108.4

Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	91	3%	-2%
2	95	1%	-1%
3	89	1%	4%
4	87	3%	6%
5	86	7%	7%
6	82	10%	3%
7	84	8%	-4%
8	86	4%	-7%
9	92	0%	-5%
10	92	-3%	1%
11	85	-1%	9%
12	87	5%	6%
13	90	6%	3%
14	86	9%	4%
15	87	7%	-1%
16	85	7%	-7%



Total Lumen Output: 8093 lm

Voltage: 112 V, Current: 1.74 A

Color Temperature: 4213 K

Power: 189.8 W

CRI: 88.8

Efficacy: 43 Lumen/Watt

TLCI: 84

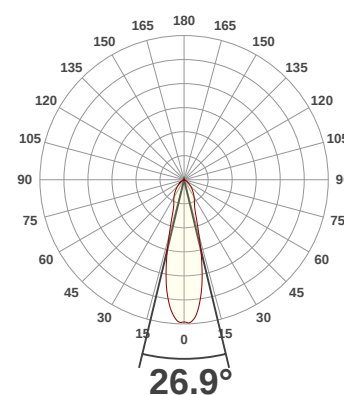
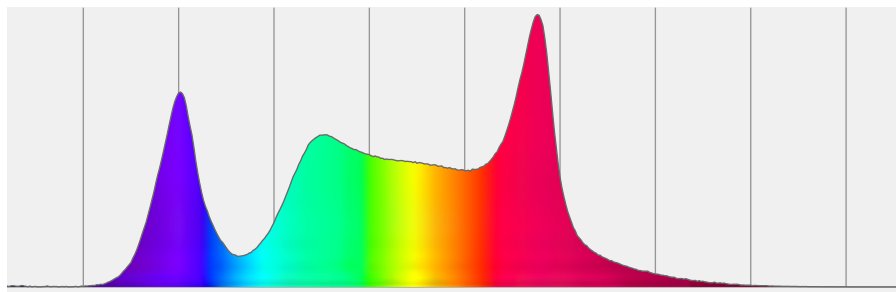
TM30: 86.8

CQS: 90.7

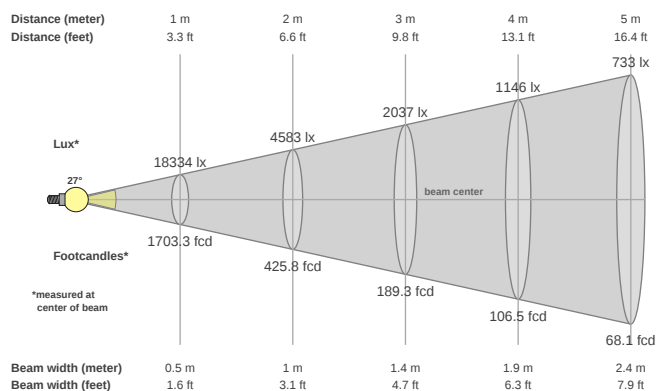
Measurement Date: 3/11/2020

Spectral distribution

Dominant Wavelength 583



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
26.9°	74.8°	115.1°

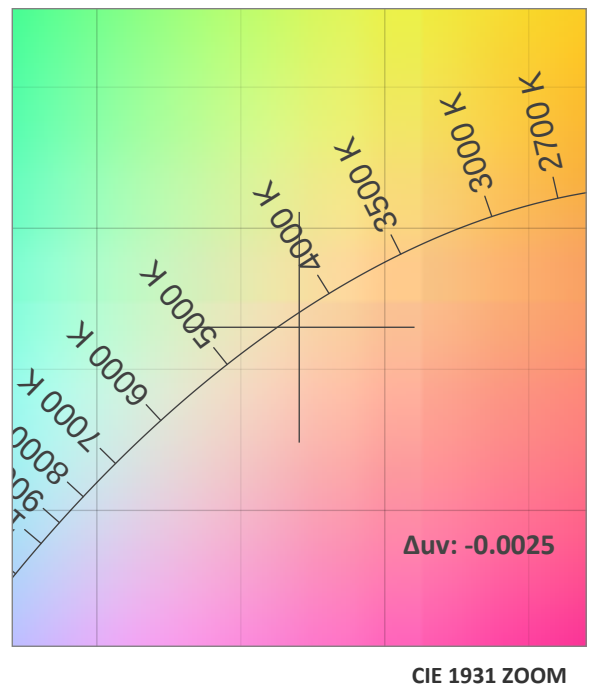
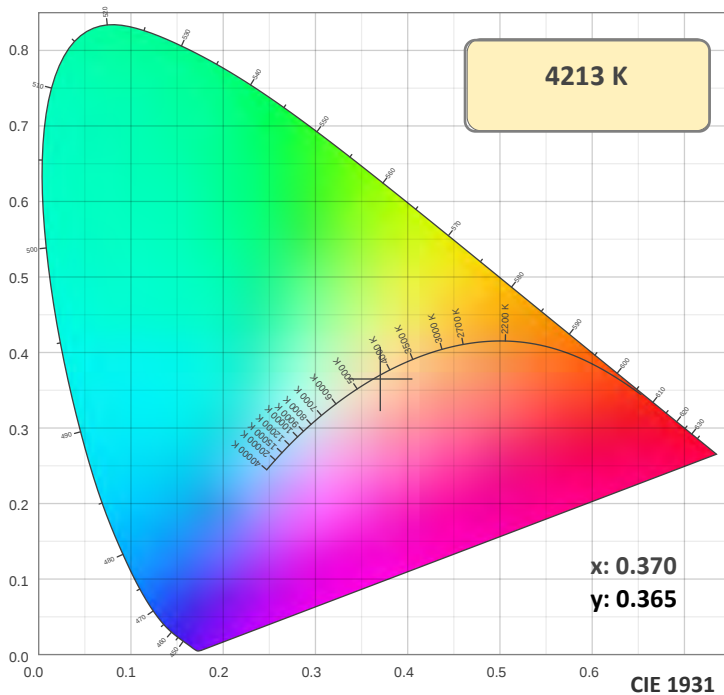
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
18458 cd	97.1%	85.4%

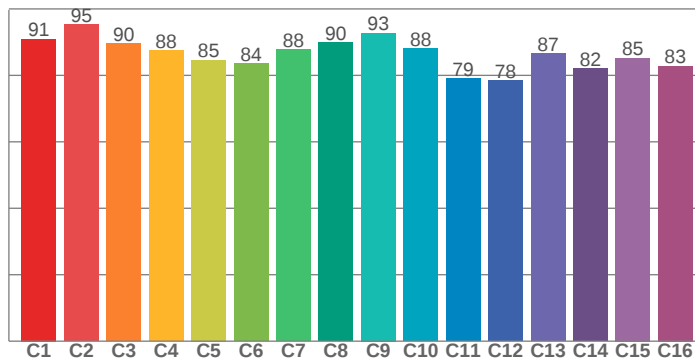
Beam Intensities from 1-20m

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	18334	4583	2037	1146	733	509	374	286	226	183	152	127	108	94	81	72	63	57	51	46
FC	1703.3	425.8	189.3	106.5	68.1	47.3	34.8	26.6	21	17	14.1	11.8	10.1	8.7	7.6	6.7	5.9	5.3	4.7	4.3

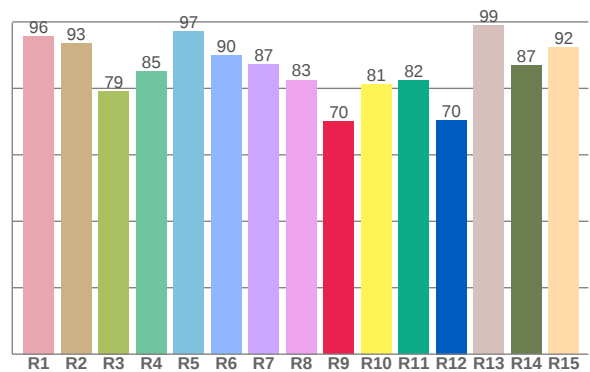
Color Details



TM30: 86.8



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
95.8	93.4	79.2	85.2	97.0	90.0	87.2	82.6	69.9	81.2	82.5	70.5	99.0	86.9	92.3

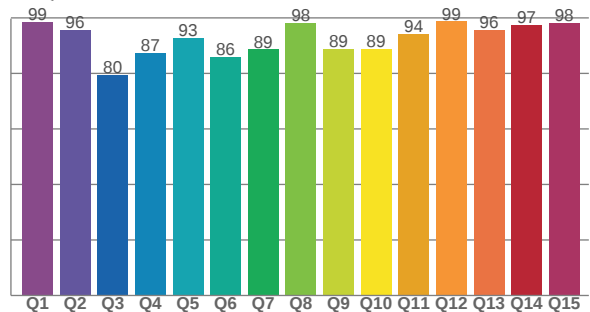
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
91.0	95.4	89.6	87.5	84.6	83.5	87.7	90.0	92.7	88.1	79.1	78.4	86.6	82.0	85.2	82.8

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.7	95.8	79.6	87.5	92.9	86.0	88.6	98.3	88.7	88.7	94.3	98.7	95.6	97.4	98.3

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
4213 K	88.8	69.9	86.8	108.0	90.7	0.370	0.365	0.223	0.330	-0.0025

TM30 Details

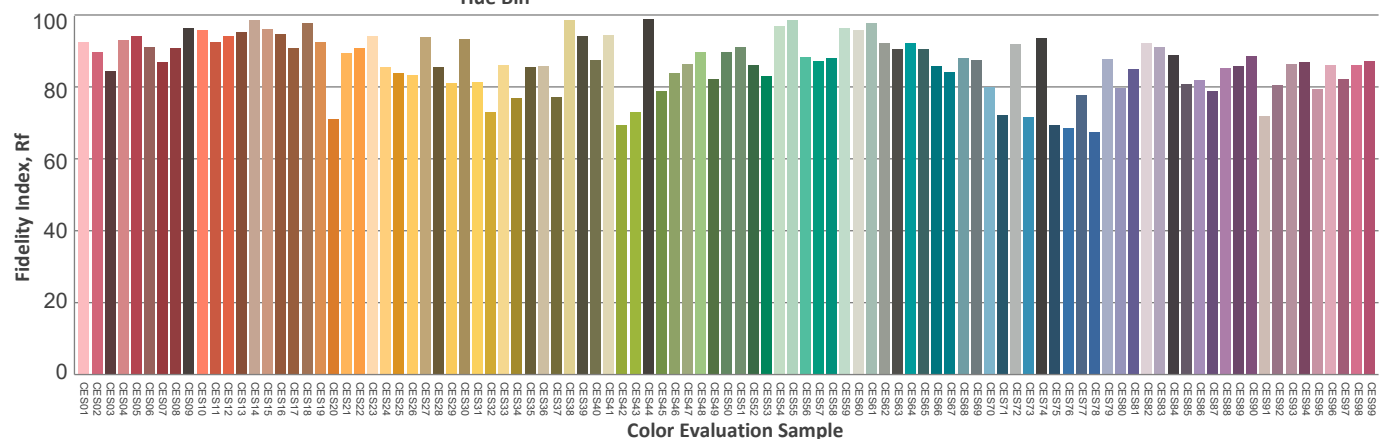
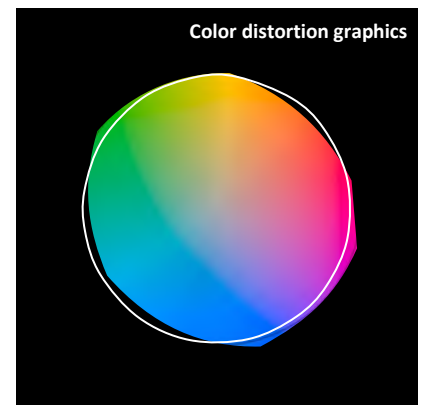
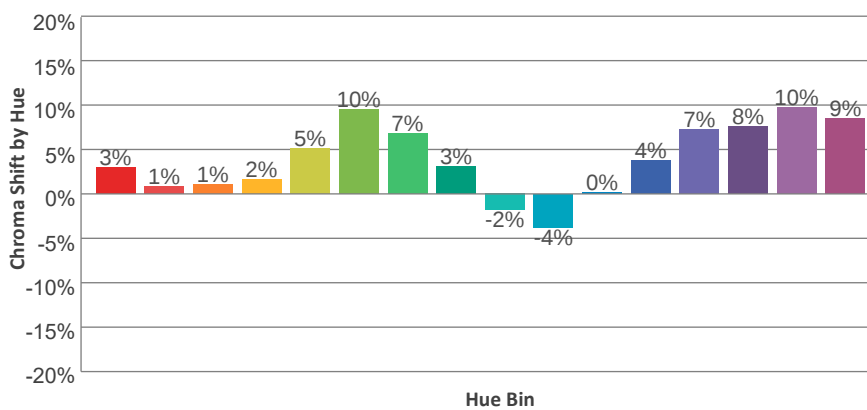
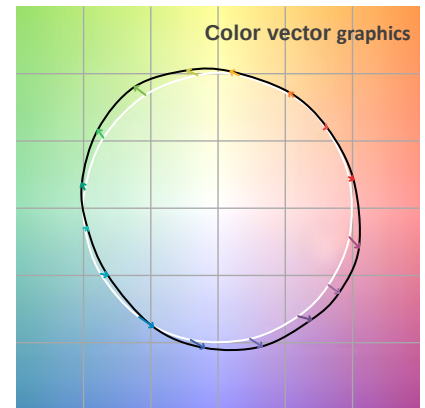
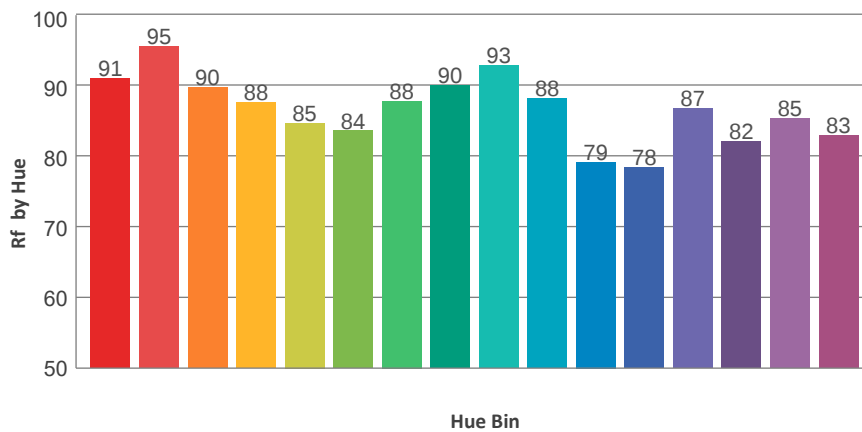
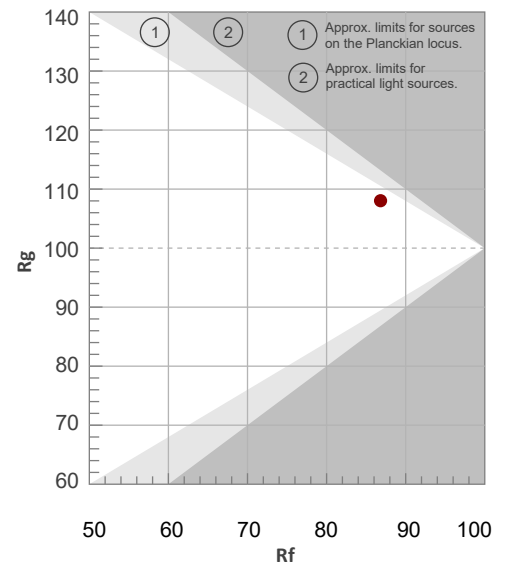
Rf 86.8

Fidelity Index Rf

Rg 108.0

Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	91	3%	-2%
2	95	1%	-1%
3	90	1%	4%
4	88	2%	7%
5	85	5%	7%
6	84	10%	3%
7	88	7%	-3%
8	90	3%	-4%
9	93	-2%	-2%
10	88	-4%	4%
11	79	0%	13%
12	78	4%	11%
13	87	7%	8%
14	82	8%	7%
15	85	10%	-1%
16	83	9%	-6%



Total Lumen Output: 8319 lm

Color Temperature: 4496 K

CRI: 88.6

TLCI: 83

TM30: 86.3

CQS: 90.3

Measurement Date: 3/11/2020

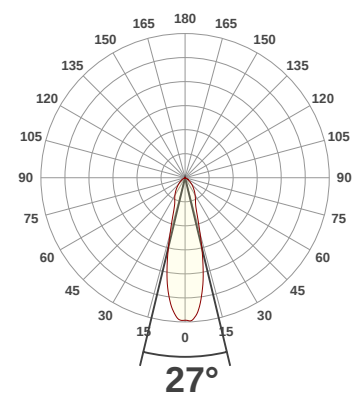
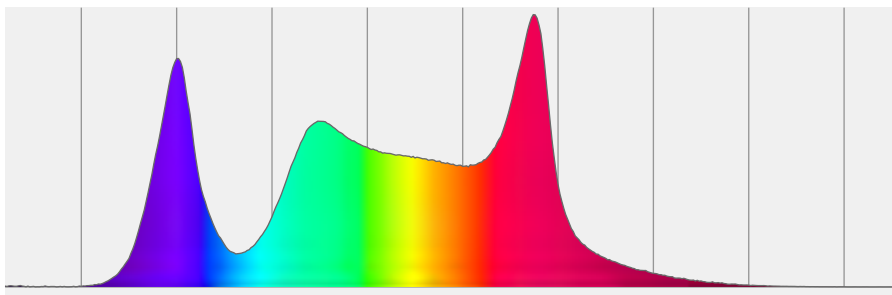
Voltage: 111 V, Current: 1.78 A

Power: 194.8 W

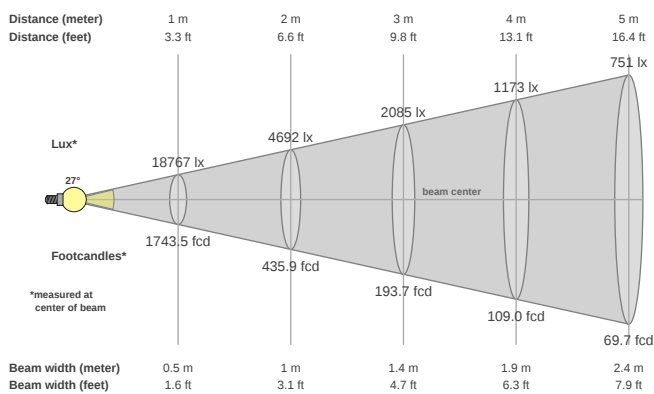
Efficacy: 43 Lumen/Watt

Spectral distribution

Dominant Wavelength 584



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
27°	74.9°	115.5°

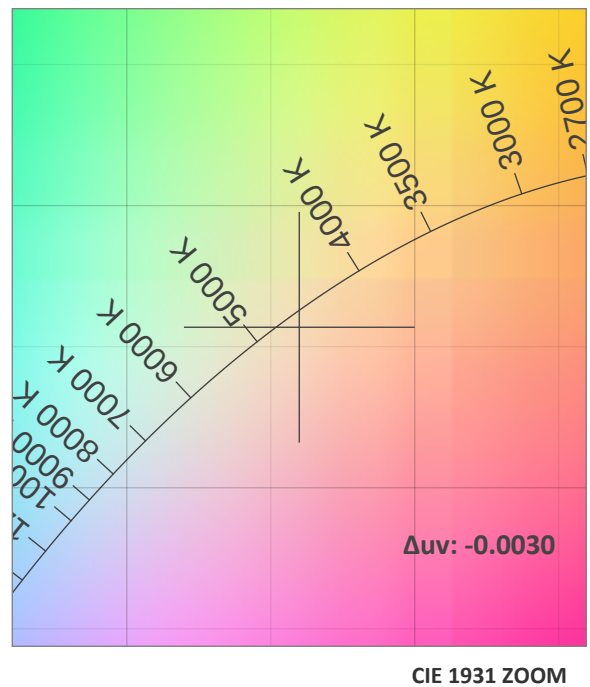
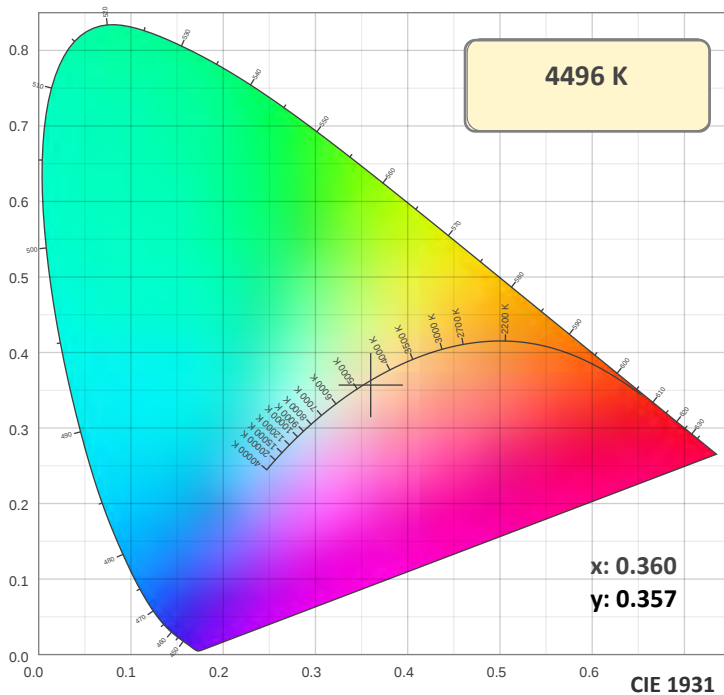
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
18870 cd	97.0%	85.2%

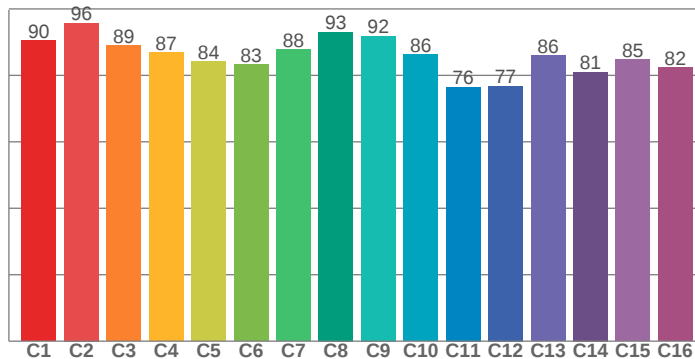
Beam Intensities from 1-20m

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	18767	4692	2085	1173	751	521	383	293	232	188	155	130	111	96	83	73	65	58	52	47
FC	1743.5	435.9	193.7	109	69.7	48.4	35.6	27.2	21.5	17.4	14.4	12.1	10.3	8.9	7.7	6.8	6	5.4	4.8	4.4

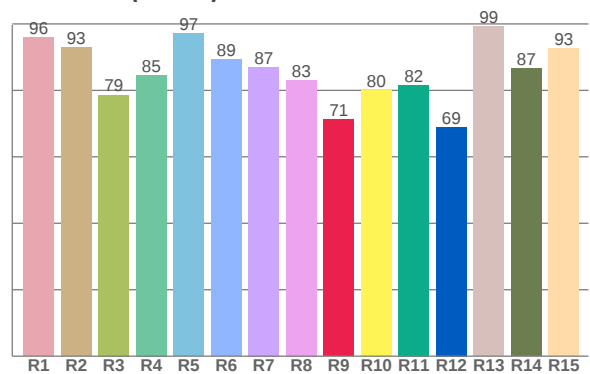
Color Details



TM30: 86.3



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
96.0	92.9	78.6	84.6	97.1	89.3	87.0	83.1	71.3	80.1	81.6	69.0	99.2	86.6	92.5

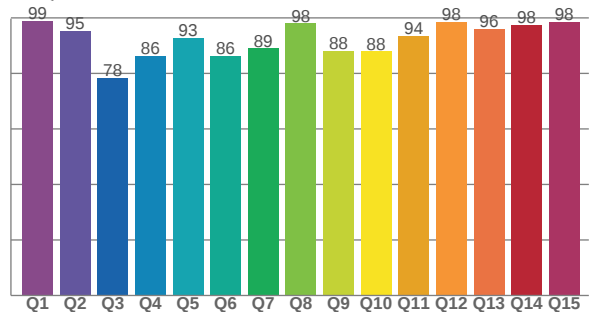
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.5	95.7	89.1	86.9	84.2	83.2	87.7	93.1	91.9	86.2	76.5	76.8	85.9	81.0	84.7	82.3

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.8	95.3	78.4	86.4	92.9	86.2	89.0	98.0	88.0	87.9	93.6	98.5	96.0	97.5	98.4

CQS: 90.3



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
4496 K	88.6	71.3	86.3	107.9	90.3	0.360	0.357	0.219	0.326	-0.0030

TM30 Details

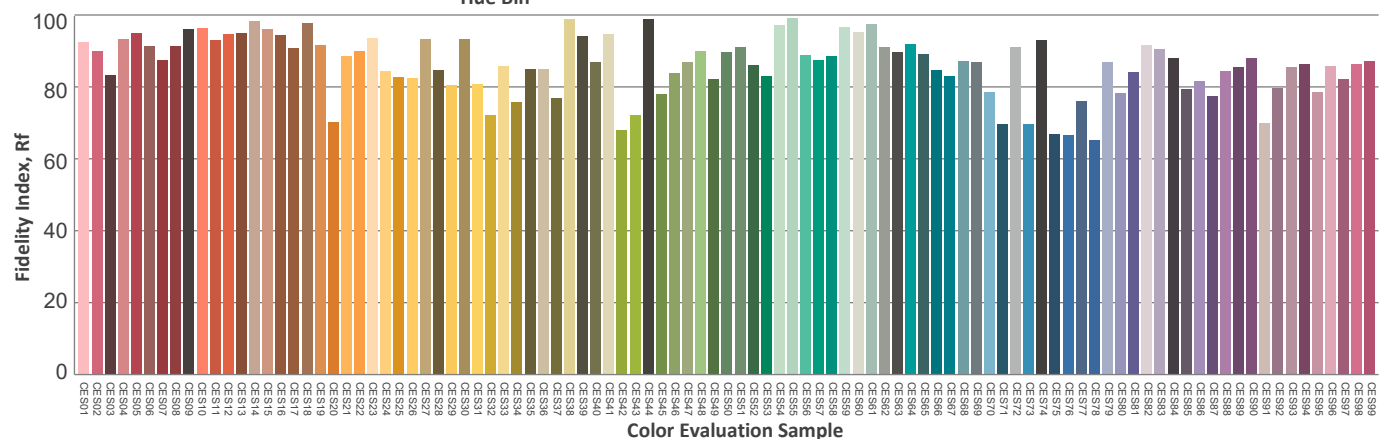
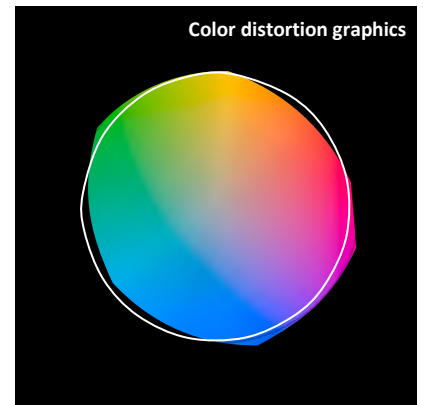
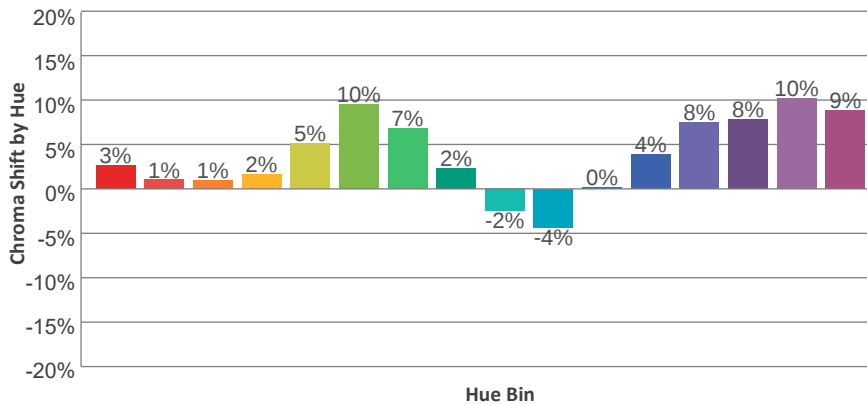
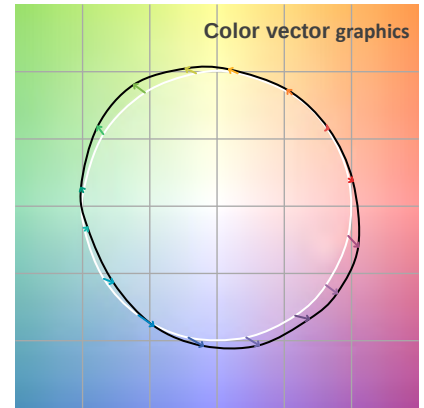
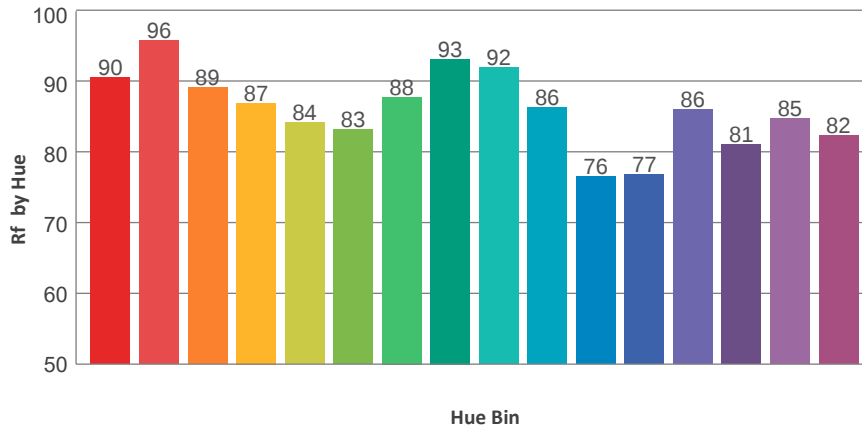
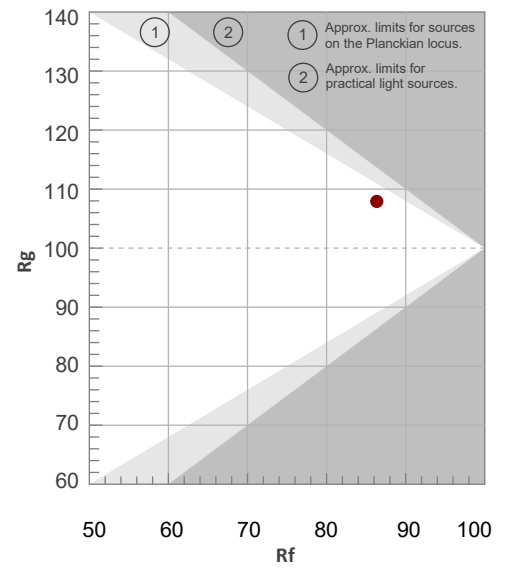
Rf 86.3

Fidelity Index Rf

Rg 107.9

Gamut Index Rg

Hue Bin	R_i	Graphic shifts (%)	
		Chroma	Hue
1	90	3%	-2%
2	96	1%	-1%
3	89	1%	5%
4	87	2%	7%
5	84	5%	7%
6	83	10%	4%
7	88	7%	-2%
8	93	2%	-3%
9	92	-2%	-2%
10	86	-4%	6%
11	76	0%	14%
12	77	4%	12%
13	86	8%	8%
14	81	8%	7%
15	85	10%	0%
16	82	9%	-6%



Total Lumen Output: 8349 lm

Color Temperature: 4998 K

CRI: 88.6

TLCI: 83

TM30: 85.5

CQS: 89.3

Measurement Date: 3/11/2020

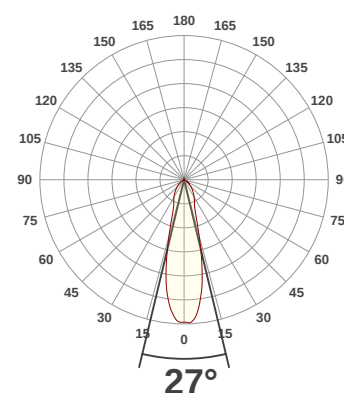
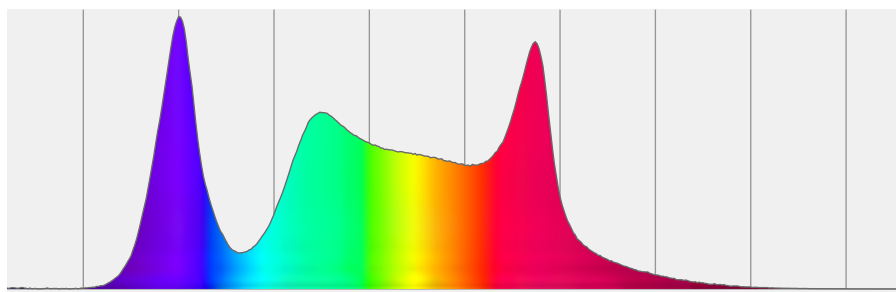
Voltage: 111 V, Current: 1.80 A

Power: 196.6 W

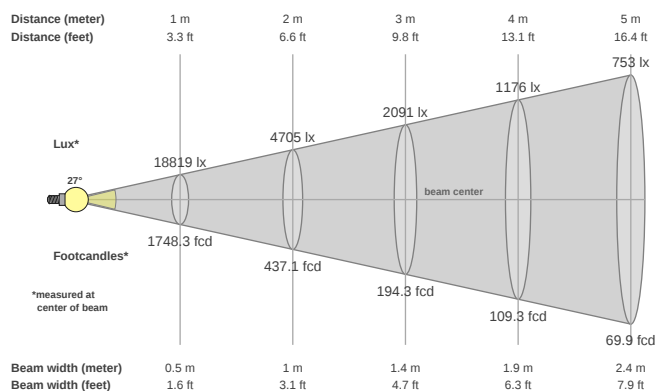
Efficacy: 42 Lumen/Watt

Spectral distribution

Dominant Wavelength 586



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
27°	74.9°	115.4°

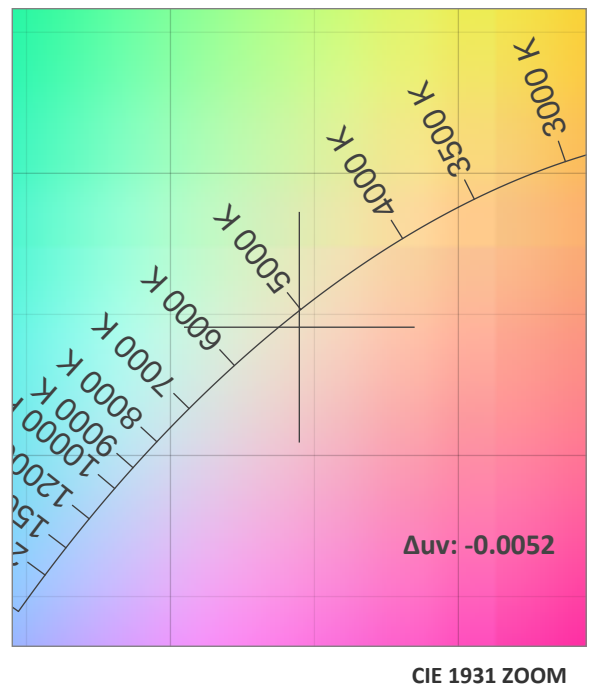
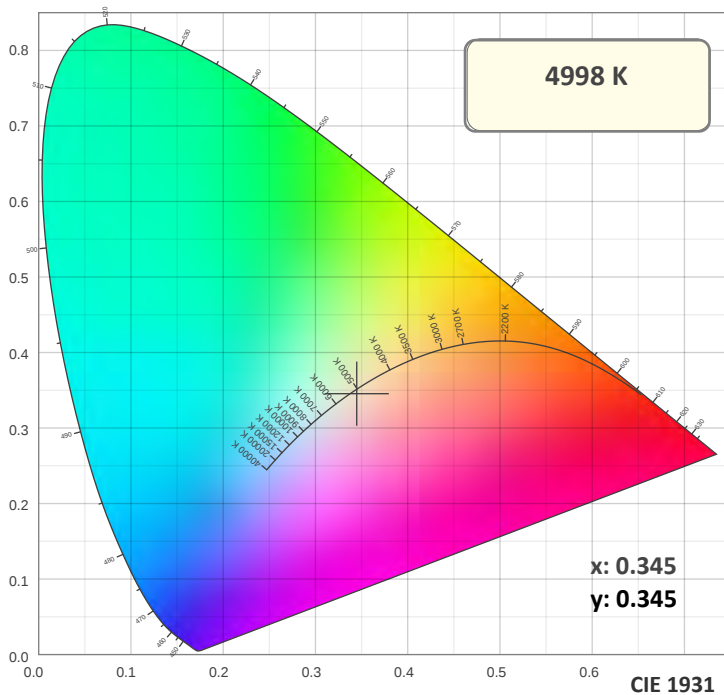
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
18938 cd	97.0%	85.2%

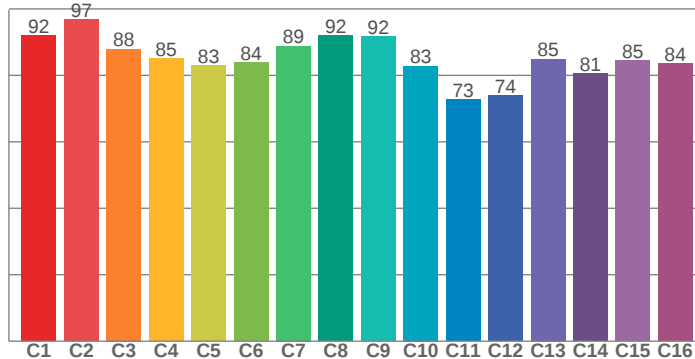
Beam Intensities from 1-20m

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	18819	4705	2091	1176	753	523	384	294	232	188	156	131	111	96	84	74	65	58	52	47
FC	1748.3	437.1	194.3	109.3	69.9	48.6	35.7	27.3	21.6	17.5	14.4	12.1	10.3	8.9	7.8	6.8	6	5.4	4.8	4.4

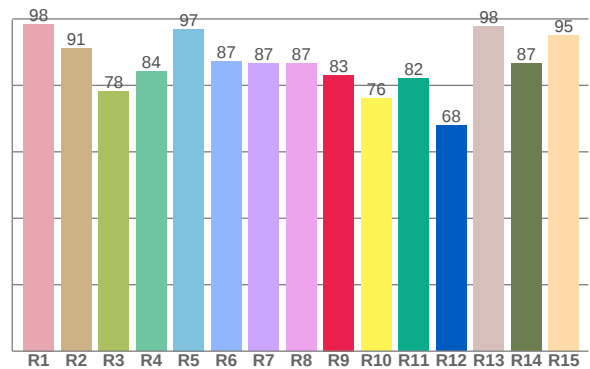
Color Details



TM30: 85.5



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
98.5	91.1	78.1	84.2	96.9	87.2	86.6	83.1	76.0	82.0	67.9	97.8	86.5	95.2	

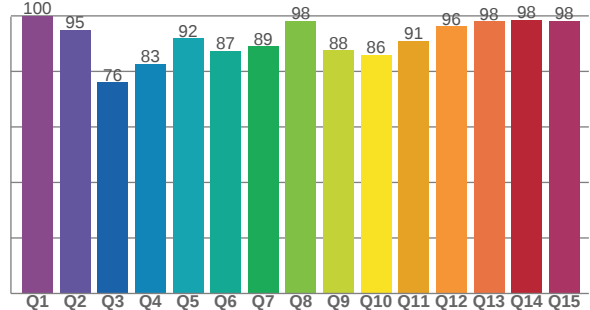
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
92.1	96.8	88.0	85.0	82.9	83.8	88.9	91.9	91.8	82.8	72.7	74.0	84.9	80.5	84.6	83.5

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.9	94.8	76.0	82.7	91.9	87.5	89.0	98.1	87.6	86.0	91.0	96.2	98.0	98.4	98.3

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 Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
4998 K	88.6	83.1	85.5	106.7	89.3	0.345	0.345	0.214	0.321	-0.0052

TM30 Details

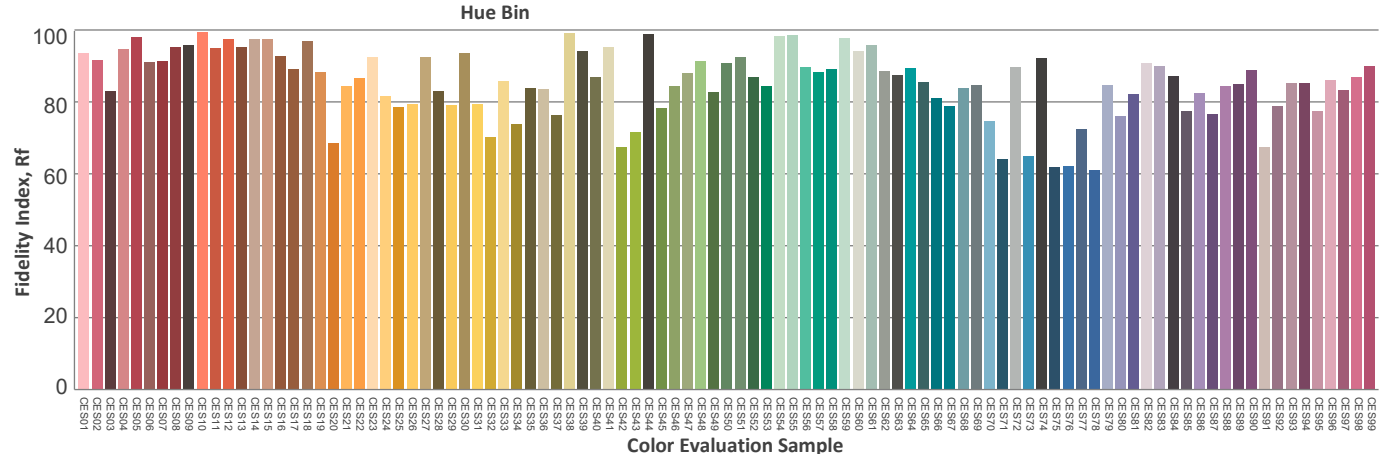
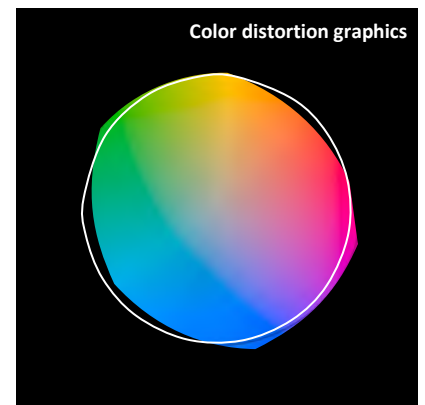
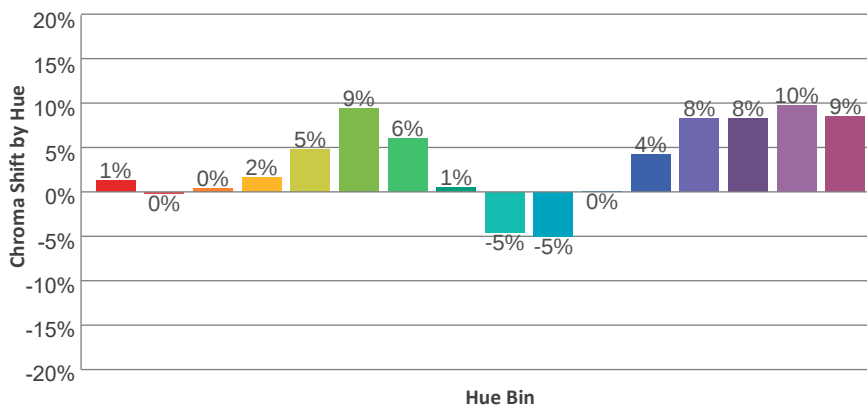
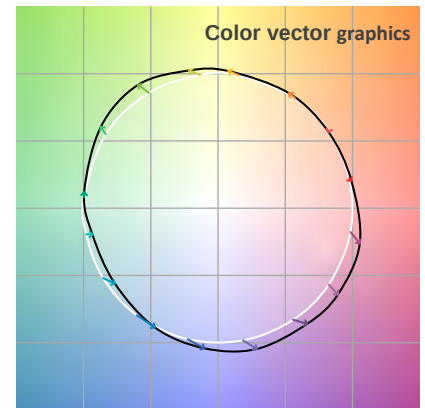
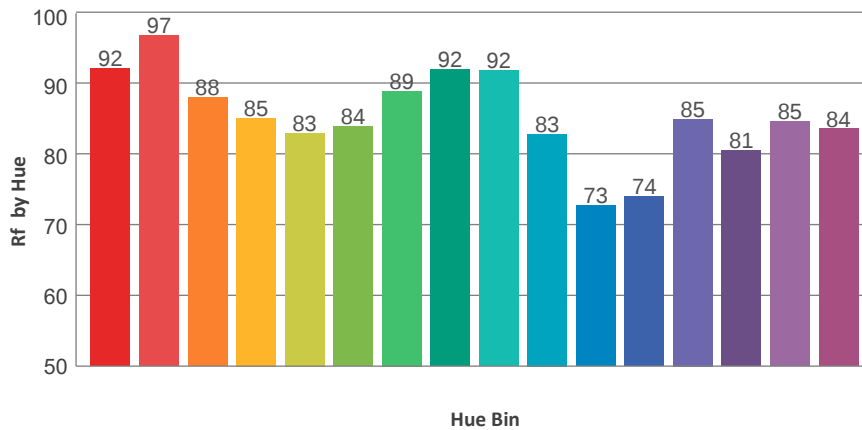
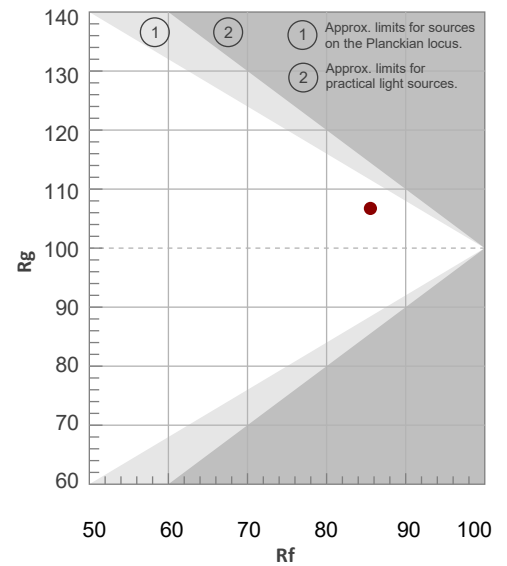
Rf 85.5

Fidelity Index Rf

Rg 106.7

Gamut Index Rg

Hue Bin	R_i	Graphic shifts (%)	
		Chroma	Hue
1	92	1%	-2%
2	97	0%	0%
3	88	0%	5%
4	85	2%	8%
5	83	5%	7%
6	84	9%	3%
7	89	6%	-2%
8	92	1%	-4%
9	92	-5%	1%
10	83	-5%	8%
11	73	0%	16%
12	74	4%	13%
13	85	8%	9%
14	81	8%	7%
15	85	10%	-2%
16	84	9%	-7%



Total Lumen Output: 8259 lm

Color Temperature: 5616 K

CRI: 87.8

TLCI: 84

TM30: 83.9

CQS: 88.1

Measurement Date: 3/11/2020

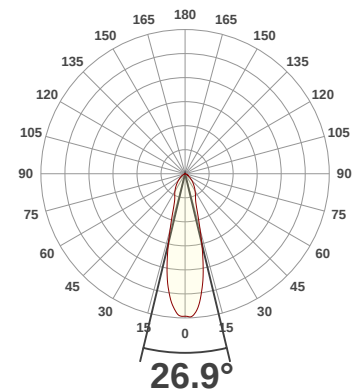
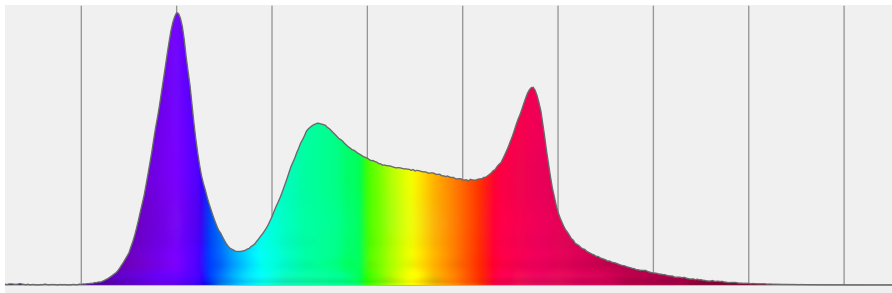
Voltage: 112 V, Current: 1.79 A

Power: 197.5 W

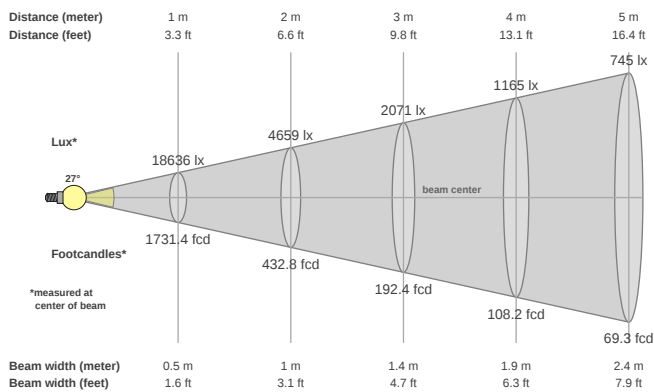
Efficacy: 42 Lumen/Watt

Spectral distribution

Dominant Wavelength 596



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
26.9°	74.9°	115.4°

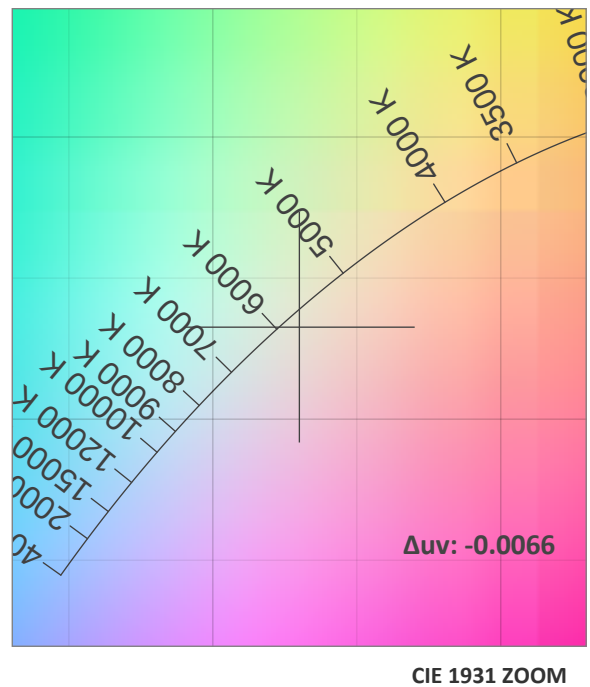
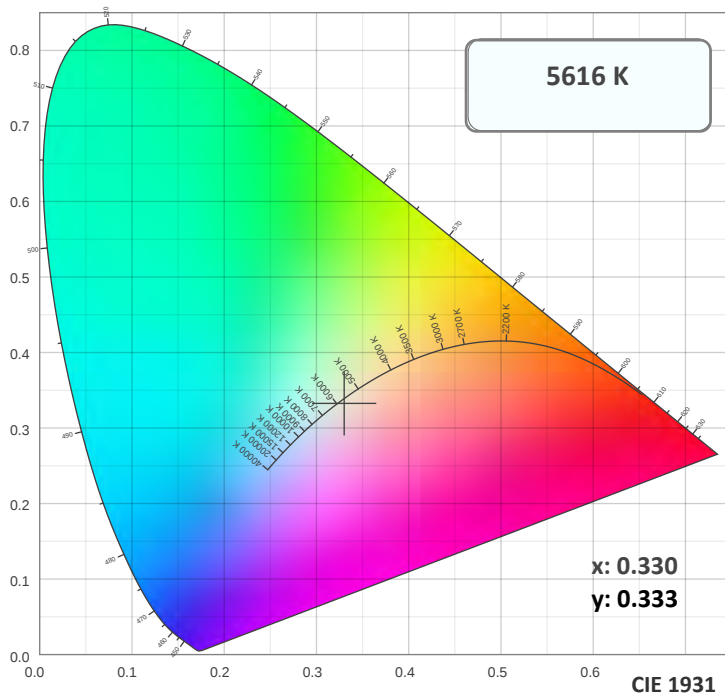
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
18743 cd	97.0%	85.2%

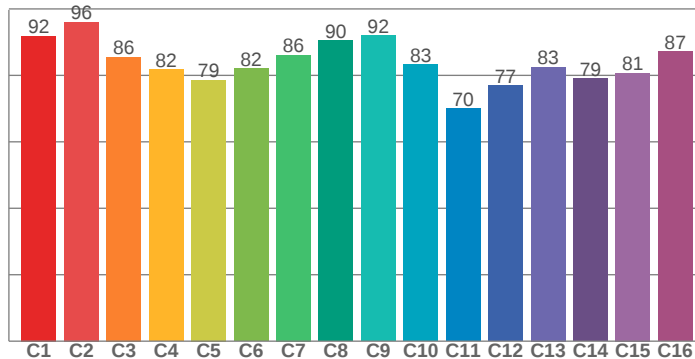
Beam Intensities from 1-20m

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	18636	4659	2071	1165	745	518	380	291	230	186	154	129	110	95	83	73	64	58	52	47
FC	1731.4	432.8	192.4	108.2	69.3	48.1	35.3	27.1	21.4	17.3	14.3	12	10.2	8.8	7.7	6.8	6	5.3	4.8	4.3

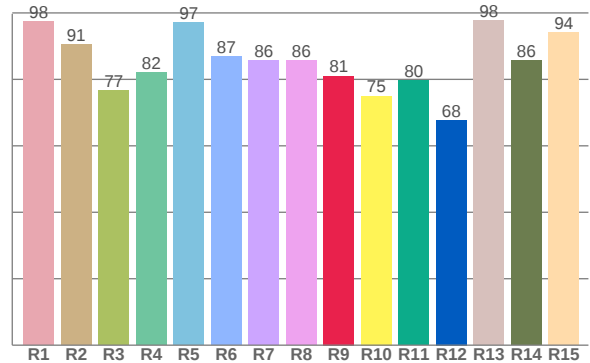
Color Details



TM30: 83.9



CRI: 87.8 (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
97.5	90.6	76.7	82.2	97.1	86.8	85.6	85.6	81.0	75.0	79.6	67.8	97.8	85.8	94.0

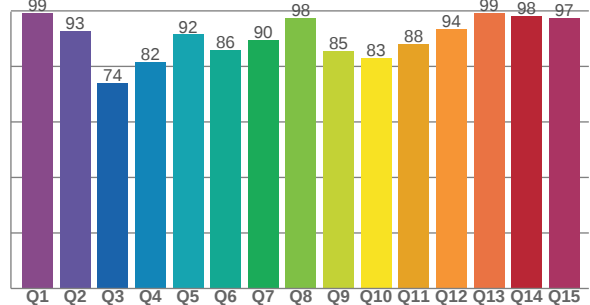
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
91.9	96.0	85.5	81.7	78.6	82.0	86.1	90.5	91.9	83.3	70.0	77.0	82.5	79.1	80.7	87.2

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.3	92.8	73.9	81.7	91.5	86.0	89.5	97.6	85.5	83.1	88.2	93.6	99.2	98.2	97.5

CQS: 88.1



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
5616 K	87.8	81.0	83.9	108.3	88.1	0.330	0.333	0.209	0.315	-0.0066

TM30 Details

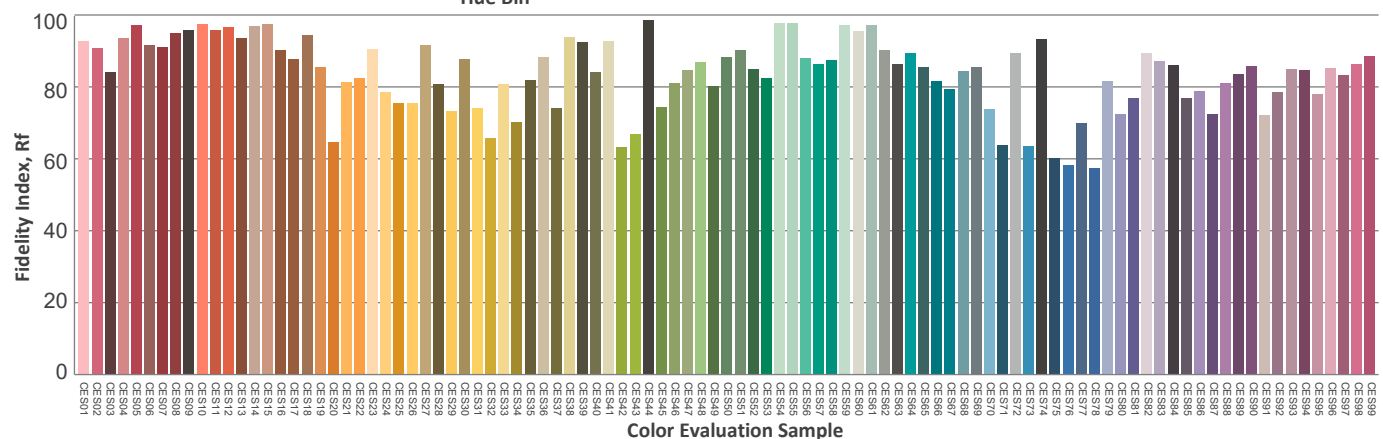
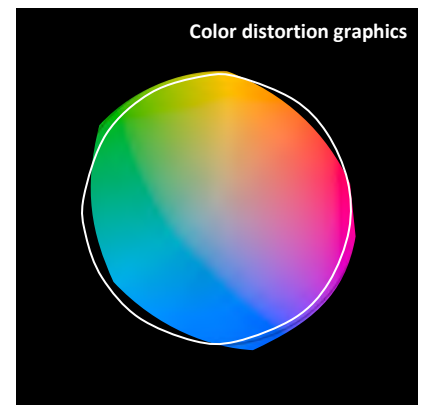
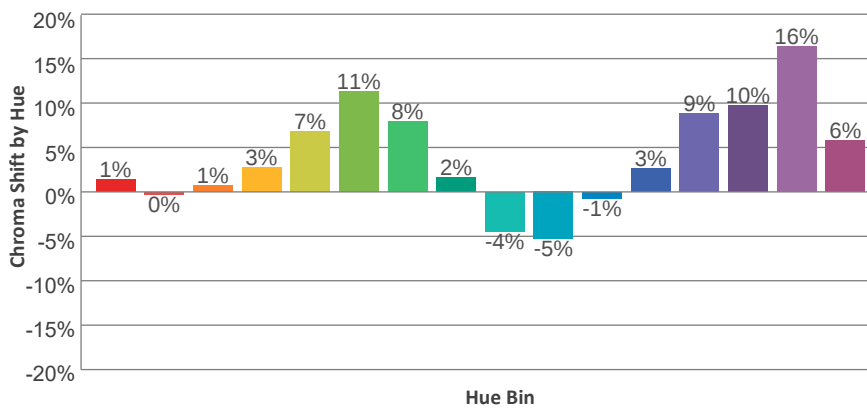
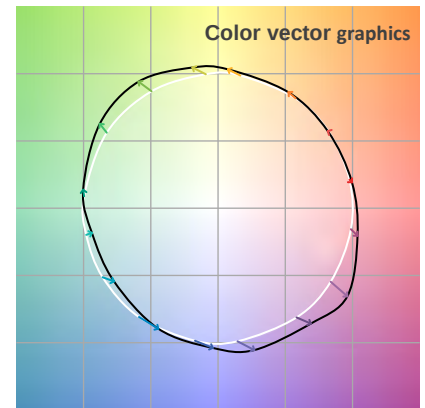
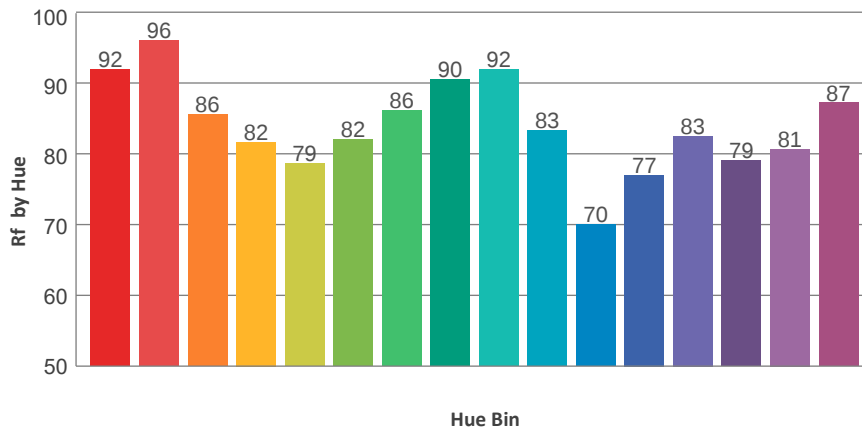
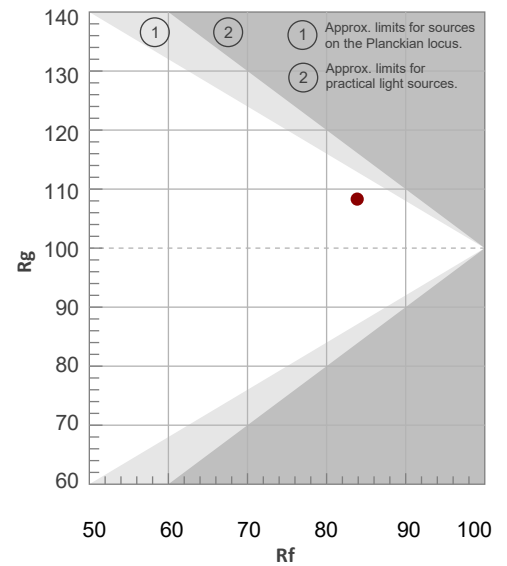
Rf 83.9

Fidelity Index Rf

Rg 108.3

Gamut Index Rg

Hue Bin	R_i	Graphic shifts (%)	
		Chroma	Hue
1	92	1%	-2%
2	96	0%	1%
3	86	1%	7%
4	82	3%	10%
5	79	7%	9%
6	82	11%	4%
7	86	8%	-3%
8	90	2%	-5%
9	92	-4%	-1%
10	83	-5%	7%
11	70	-1%	17%
12	77	3%	14%
13	83	9%	11%
14	79	10%	6%
15	81	16%	-2%
16	87	6%	-4%



Total Lumen Output: 8198 lm

Voltage: 112 V, Current: 1.81 A

Color Temperature: 6011 K

Power: 198.6 W

CRI: 87.2

Efficacy: 41 Lumen/Watt

TLCI: 85

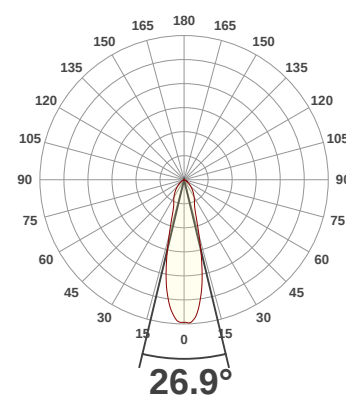
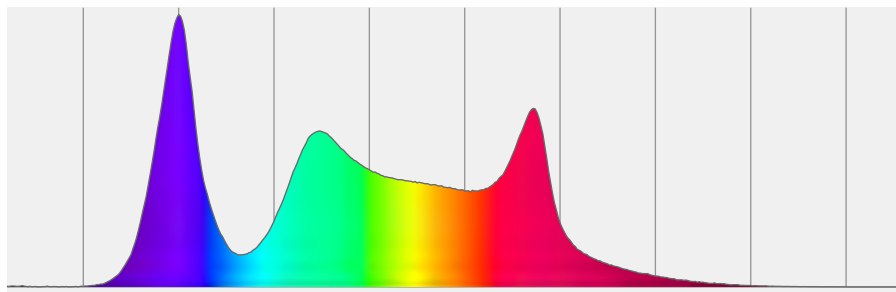
TM30: 83.7

CQS: 88.2

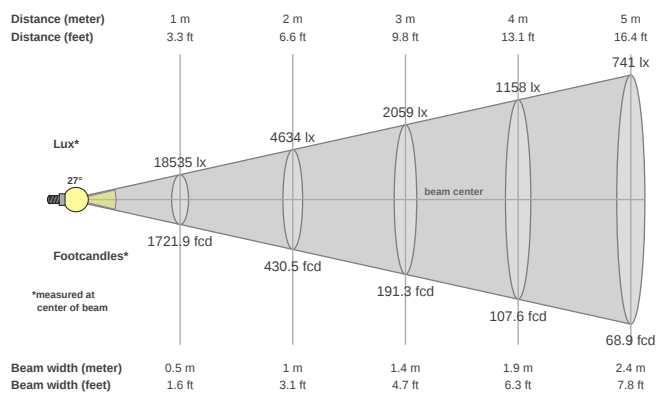
Measurement Date: 3/11/2020

Spectral distribution

Dominant Wavelength 829



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
26.9°	74.9°	115.4°

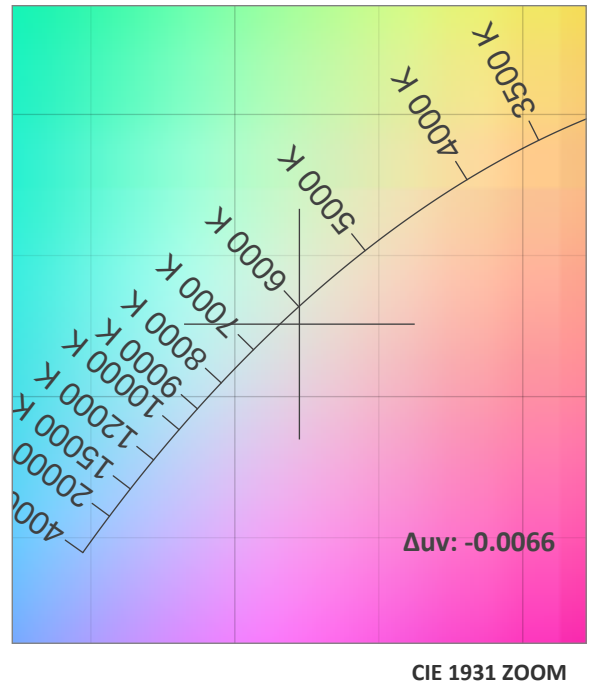
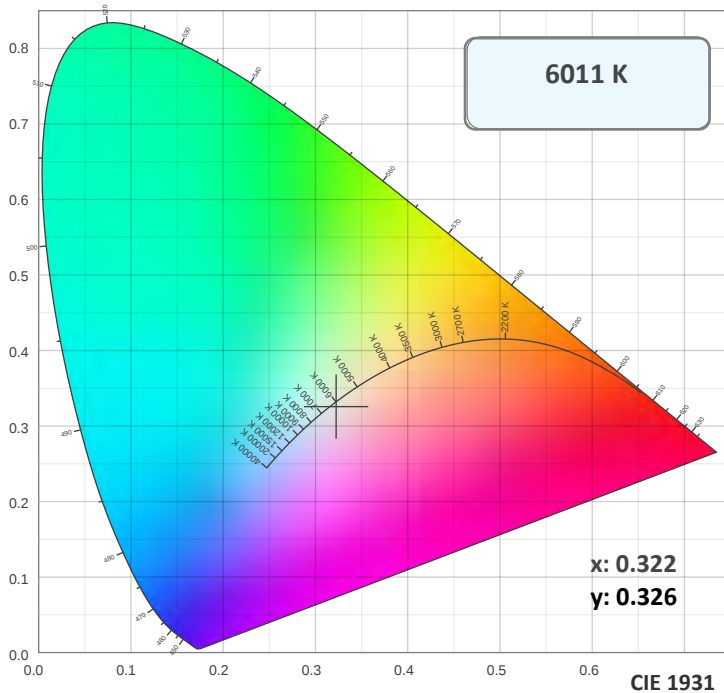
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
18627 cd	96.9%	85.2%

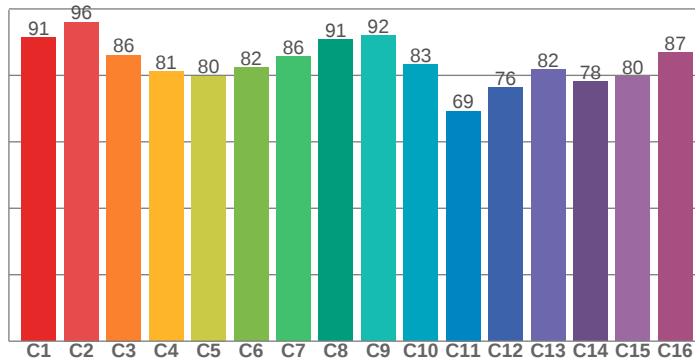
Beam Intensities from 1-20m

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	18535	4634	2059	1158	741	515	378	290	229	185	153	129	110	95	82	72	64	57	51	46
FC	1721.9	430.5	191.3	107.6	68.9	47.8	35.1	26.9	21.3	17.2	14.2	12	10.2	8.8	7.7	6.7	6	5.3	4.8	4.3

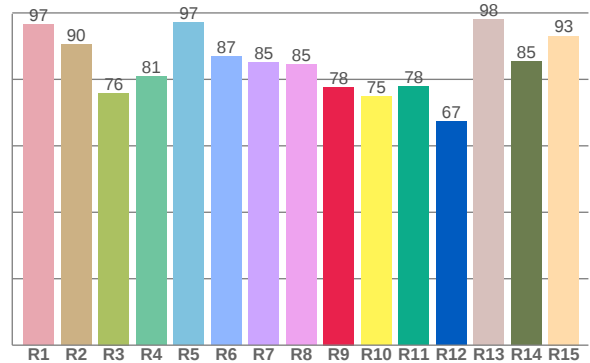
Color Details



TM30: 83.7



CRI: 87.2 (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
96.6	90.5	75.9	81.0	97.1	86.8	85.1	84.5	77.7	74.9	77.8	67.3	98.0	85.3	93.1

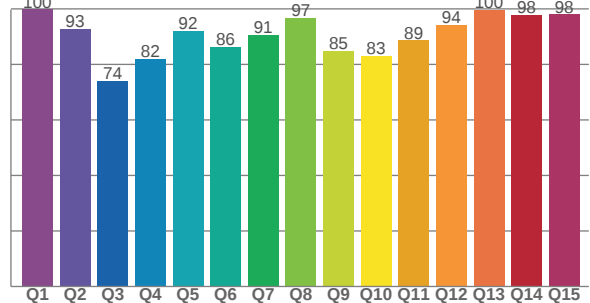
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
91.4	96.0	86.1	81.1	79.9	82.3	85.7	90.8	91.9	83.3	69.3	76.3	81.8	78.2	79.7	86.8

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.8	92.6	74.0	81.9	92.1	86.3	90.5	96.8	84.9	83.0	88.7	94.3	99.7	97.9	98.0

CQS: 88.2



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
6011 K	87.2	77.7	83.7	108.6	88.2	0.322	0.326	0.206	0.312	-0.0066

TM30 Details

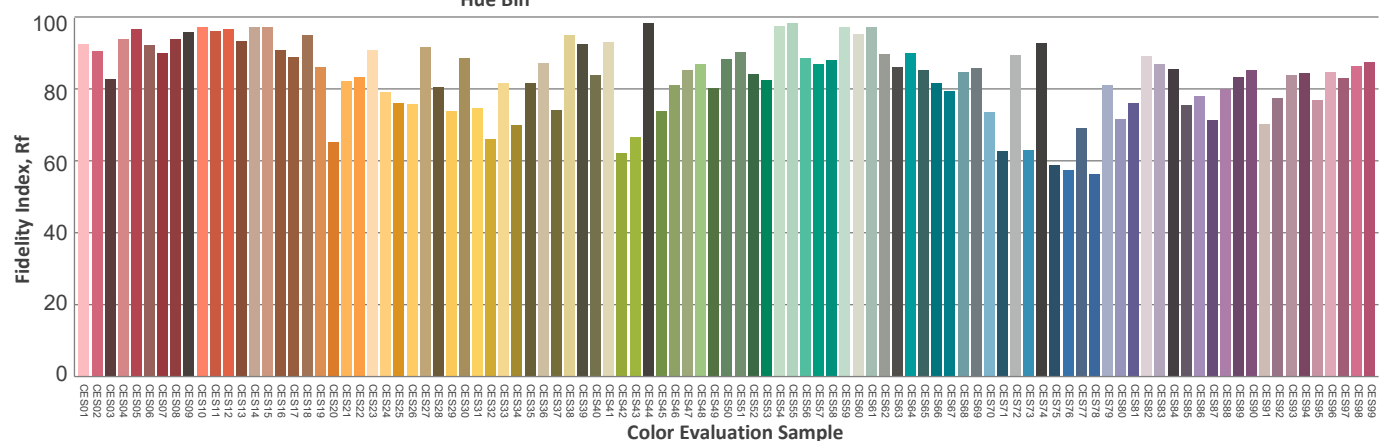
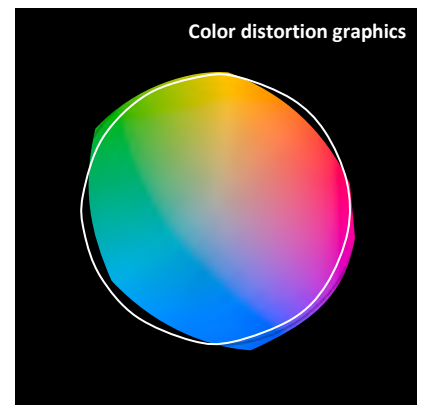
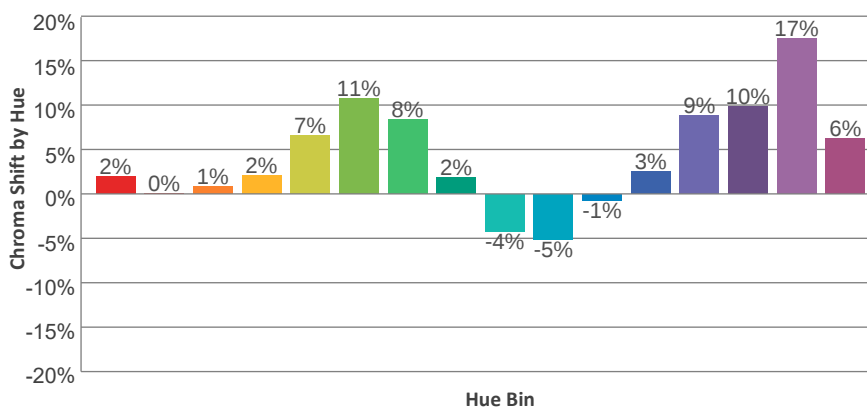
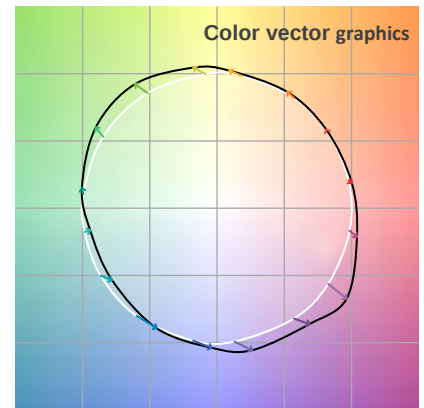
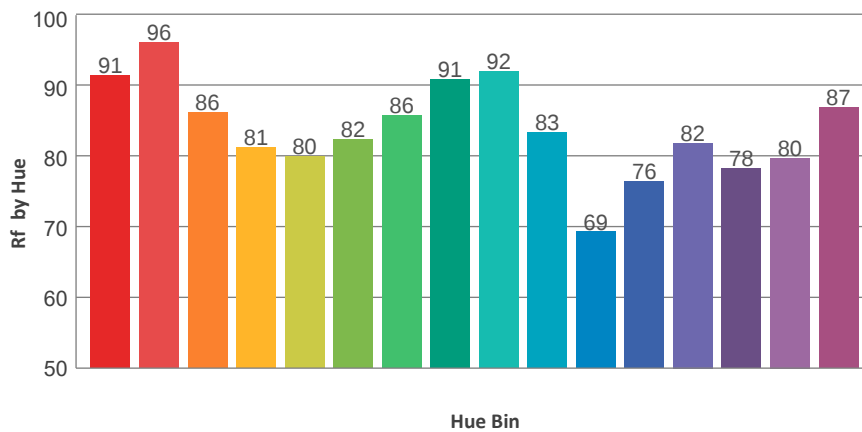
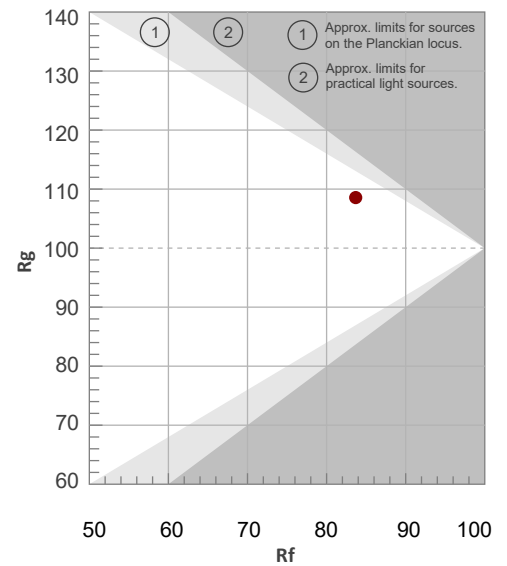
Rf 83.7

Fidelity Index Rf

Rg 108.6

Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	91	2%	-2%
2	96	0%	0%
3	86	1%	7%
4	81	2%	10%
5	80	7%	8%
6	82	11%	4%
7	86	8%	-3%
8	91	2%	-4%
9	92	-4%	0%
10	83	-5%	7%
11	69	-1%	17%
12	76	3%	14%
13	82	9%	12%
14	78	10%	7%
15	80	17%	-1%
16	87	6%	-3%



Total Lumen Output: 8292 lm

Voltage: 112 V, Current: 1.87 A

Color Temperature: 6475 K

Power: 205.5 W

CRI: 85.9

Efficacy: 40 Lumen/Watt

TLCI: 83

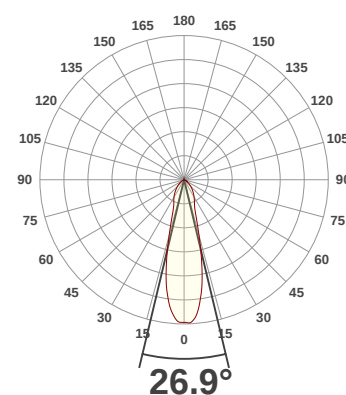
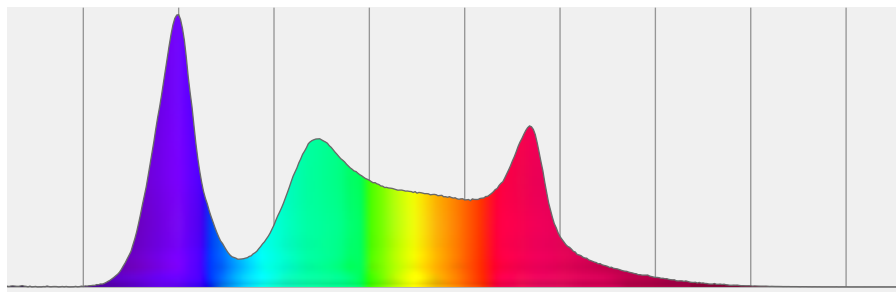
TM30: 82.4

CQS: 87.7

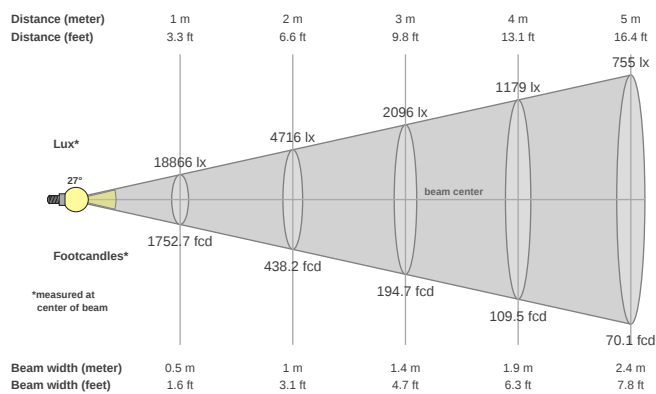
Measurement Date: 3/11/2020

Spectral distribution

Dominant Wavelength 360



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
26.9°	74.7°	114.9°

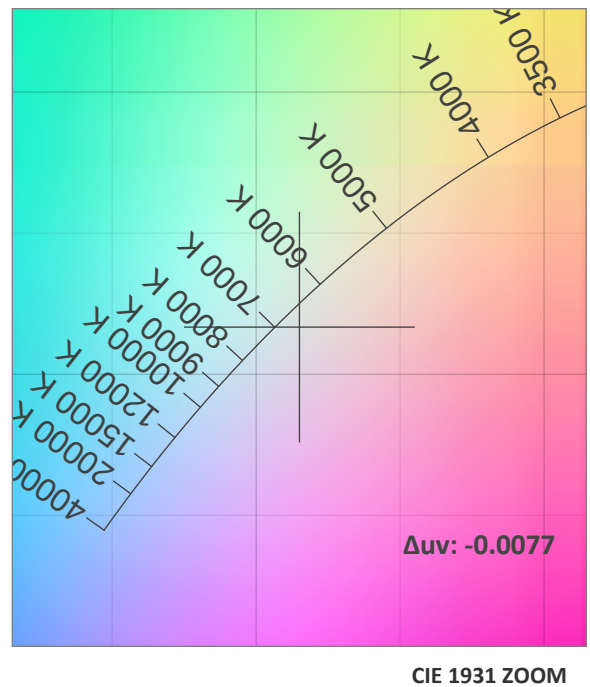
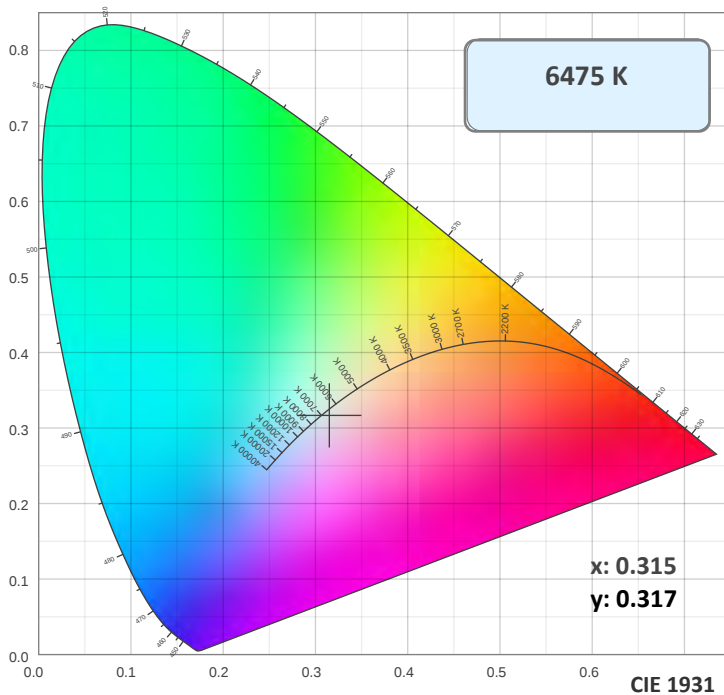
Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
18948 cd	97.1%	85.5%

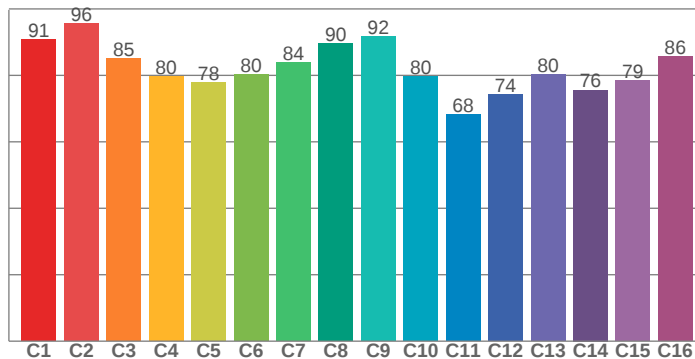
Beam Intensities from 1-20m

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	18866	4716	2096	1179	755	524	385	295	233	189	156	131	112	96	84	74	65	58	52	47
FC	1752.7	438.2	194.7	109.5	70.1	48.7	35.8	27.4	21.6	17.5	14.5	12.2	10.4	8.9	7.8	6.8	6.1	5.4	4.9	4.4

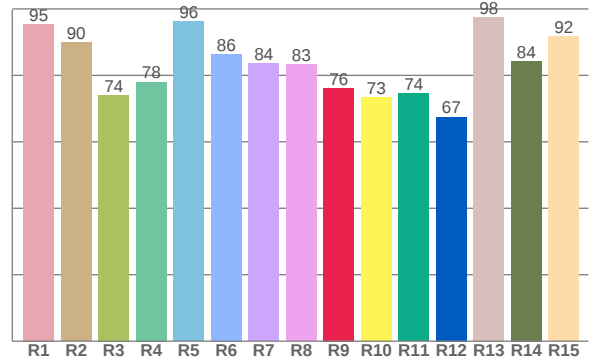
Color Details



TM30: 82.4



CRI: 85.9 (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
95.4	89.8	74.1	78.0	96.3	86.5	83.6	83.2	76.2	73.5	74.5	67.5	97.5	84.3	91.8

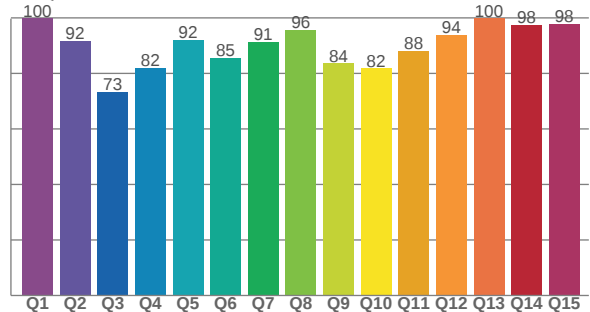
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.8	95.5	85.0	79.6	77.9	80.3	83.9	89.6	91.7	79.7	68.3	74.2	80.2	75.6	78.5	85.7

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.8	91.8	73.3	81.9	92.1	85.5	91.3	95.6	83.6	81.8	88.0	94.0	99.8	97.6	97.8

CQS: 87.7



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
6475 K	85.9	76.2	82.4	109.3	87.7	0.315	0.317	0.204	0.308	-0.0077

TM30 Details

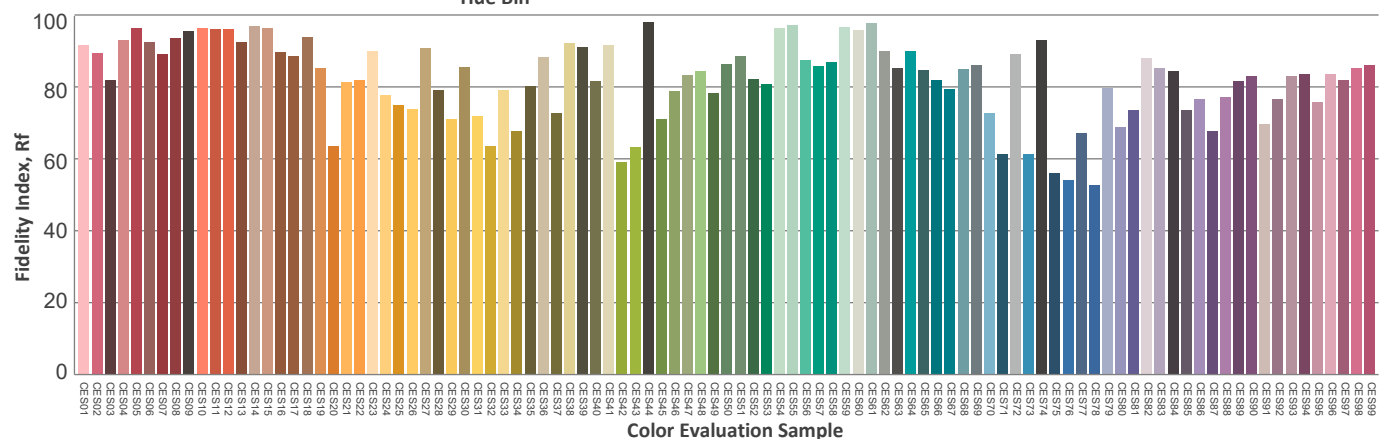
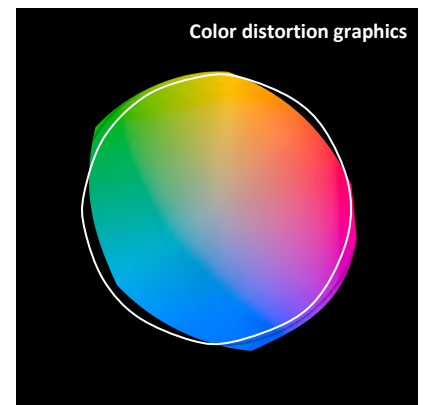
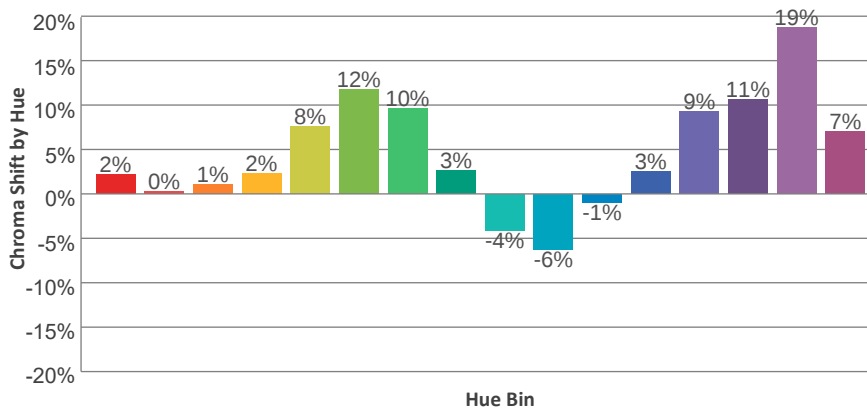
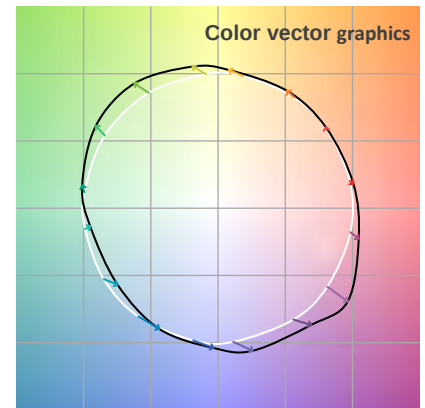
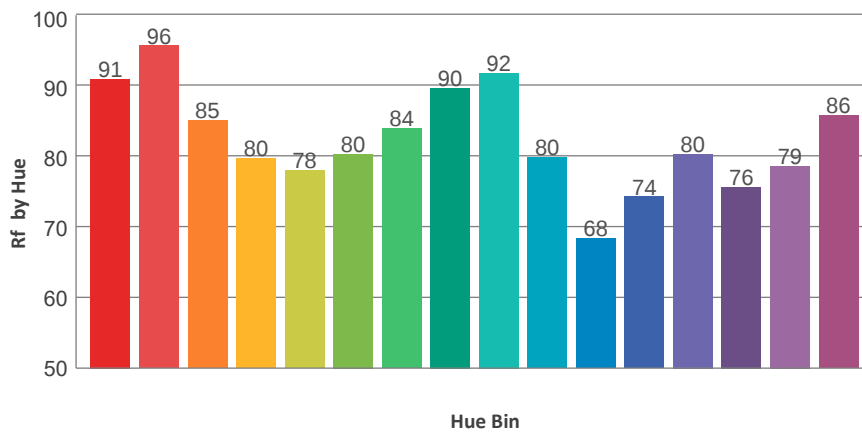
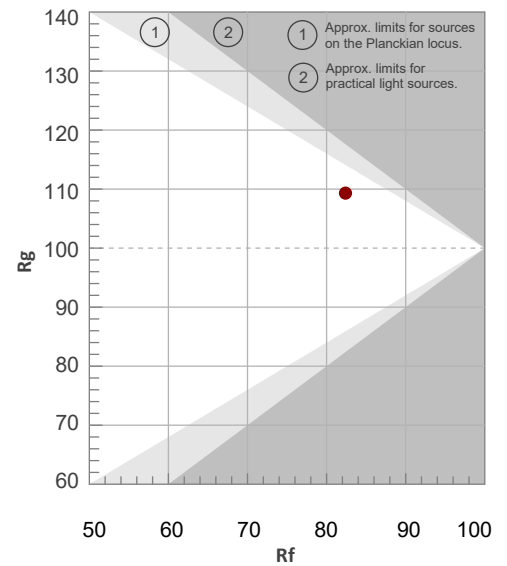
Rf 82.4

Fidelity Index Rf

Rg 109.3

Gamut Index Rg

Hue Bin	R _f	Graphic shifts (%)	
		Chroma	Hue
1	91	2%	-2%
2	96	0%	0%
3	85	1%	7%
4	80	2%	11%
5	78	8%	9%
6	80	12%	5%
7	84	10%	-2%
8	90	3%	-5%
9	92	-4%	-1%
10	80	-6%	9%
11	68	-1%	18%
12	74	3%	16%
13	80	9%	13%
14	76	11%	9%
15	79	19%	-1%
16	86	7%	-3%



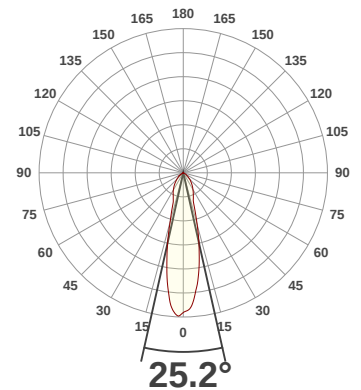
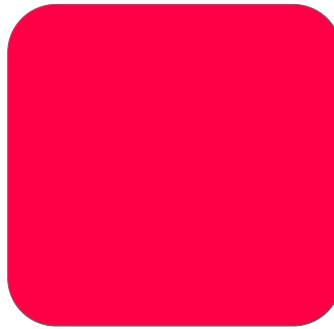
Total Lumen Output: 1027 lm

Voltage: 114 V, Current: 0.369 A

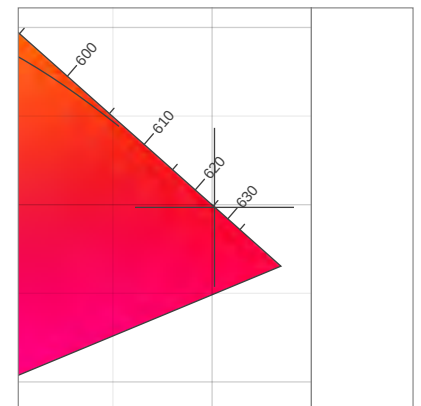
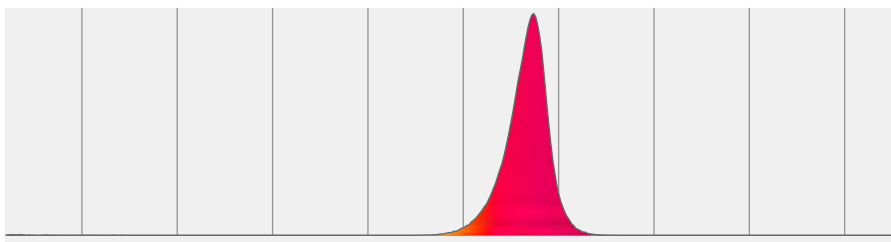
Power: 36.0 W

Efficacy: 28 Lumen/Watt

Measurement Date: 3/11/2020

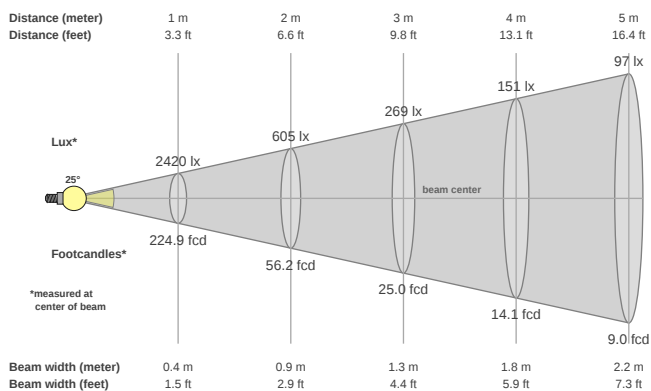


Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
626	0.701	0.298	0.542	0.346

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.2°	73.7°	113.5°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
2482 cd	96.9%	85.3%

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	2420	605	269	151	97	67	49	38	30	24	20	17	14	12	11	9	8	7	7	6
FC	224.9	56.2	25	14.1	9	6.2	4.6	3.5	2.8	2.2	1.9	1.6	1.3	1.1	1	0.9	0.8	0.7	0.6	0.6

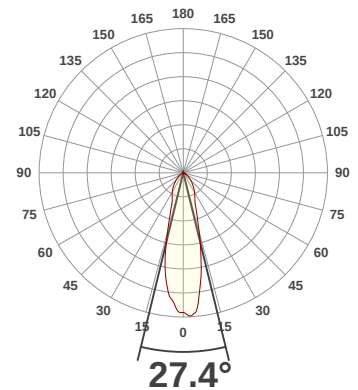
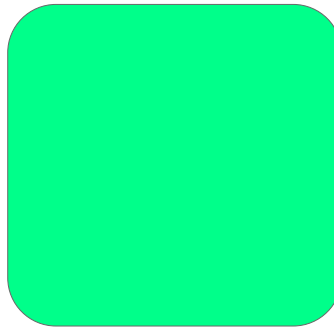
Total Lumen Output: 1648 lm

Voltage: 113 V, Current: 0.453 A

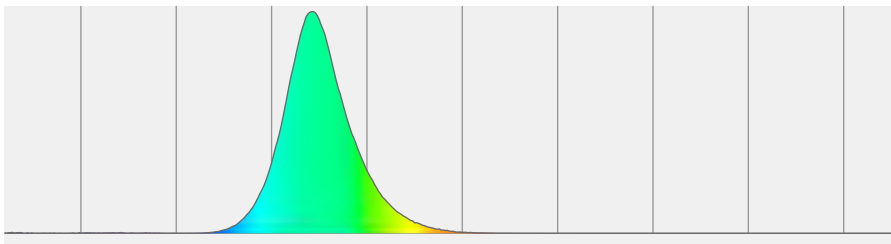
Power: 46.5 W

Efficacy: 35 Lumen/Watt

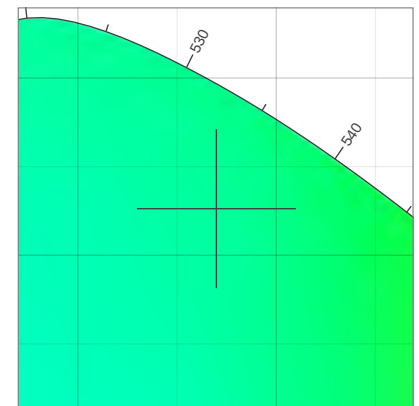
Measurement Date: 3/11/2020



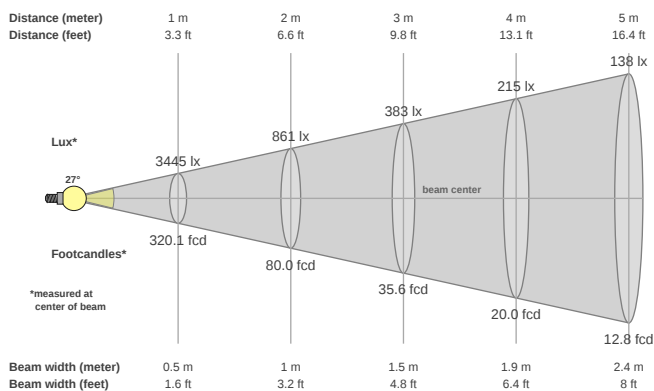
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
528	0.170	0.726	0.060	0.383



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
27.4°	78.3°	116.1°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
3534 cd	96.8%	84.9%

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	3445	861	383	215	138	96	70	54	43	34	28	24	20	18	15	13	12	11	10	9
FC	320.1	80	35.6	20	12.8	8.9	6.5	5	4	3.2	2.6	2.2	1.9	1.6	1.4	1.3	1.1	1	0.9	0.8

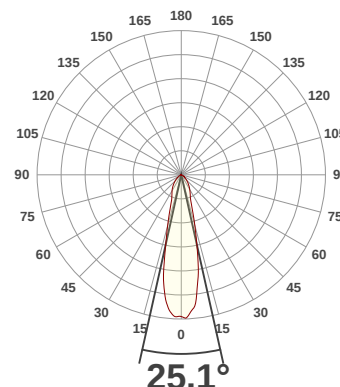
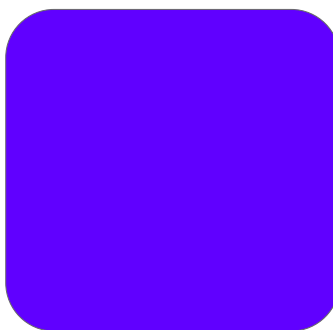
Total Lumen Output: 329 lm

Voltage: 113 V, Current: 0.422 A

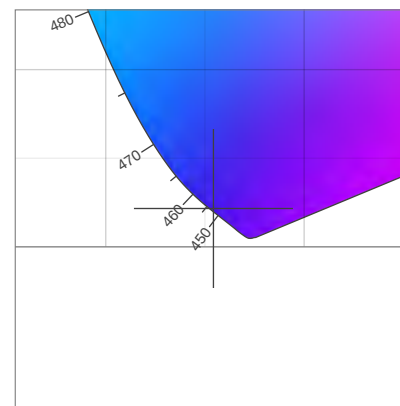
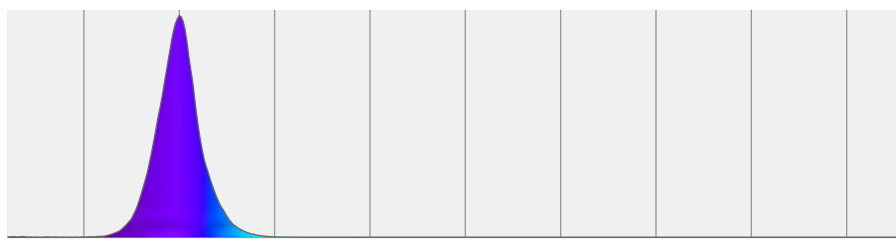
Power: 42.5 W

Efficacy: 8 Lumen/Watt

Measurement Date: 3/11/2020

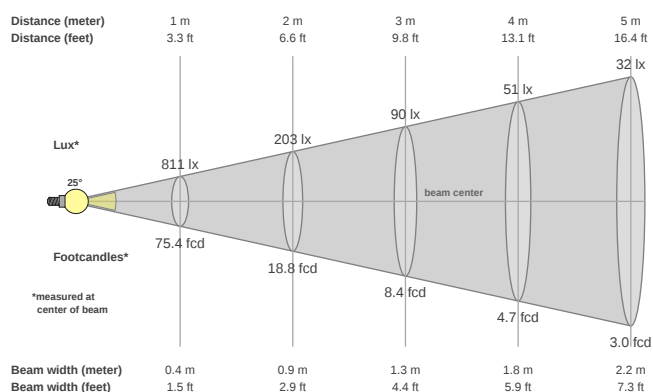


Spectral distribution



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	0.044

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.1°	69.5°	112.1°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
820 cd	96.4%	85.4%

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	811	203	90	51	32	23	17	13	10	8	7	6	5	4	4	3	3	3	2	2
FC	75.4	18.8	8.4	4.7	3	2.1	1.5	1.2	0.9	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2

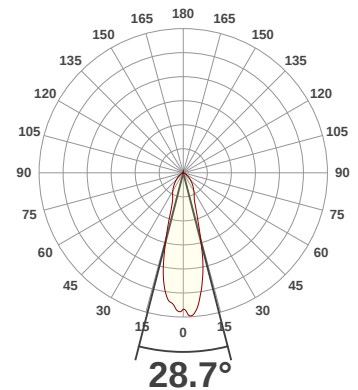
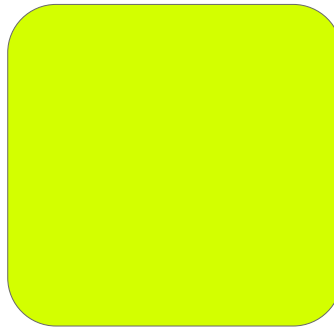
Total Lumen Output: 2710 lm

Voltage: 114 V, Current: 0.475 A

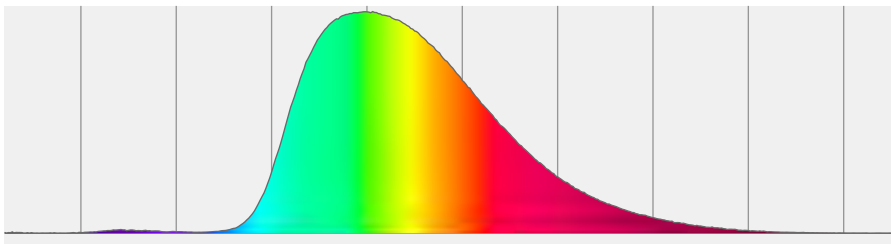
Power: 49.5 W

Efficacy: 55 Lumen/Watt

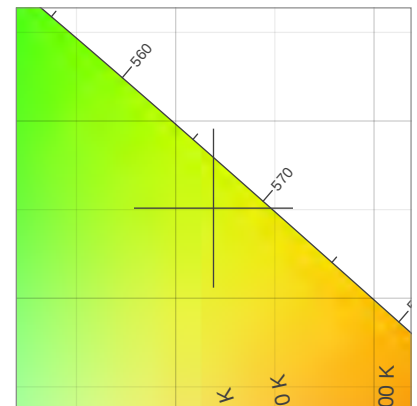
Measurement Date: 3/11/2020



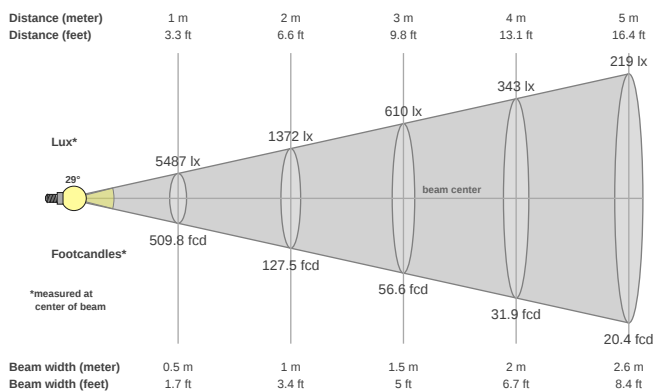
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
568	0.419	0.551	0.191	0.377



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
28.7°	77°	117.3°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
5761 cd	96.4%	84.6%

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	5487	1372	610	343	219	152	112	86	68	55	45	38	32	28	24	21	19	17	15	14
FC	509.8	127.5	56.6	31.9	20.4	14.2	10.4	8	6.3	5.1	4.2	3.5	3	2.6	2.3	2	1.8	1.6	1.4	1.3

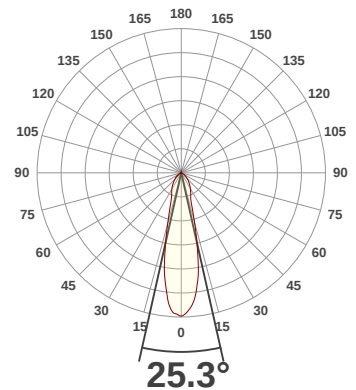
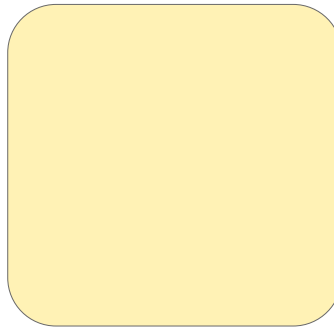
Total Lumen Output: 3728 lm

Voltage: 113 V, Current: 0.753 A

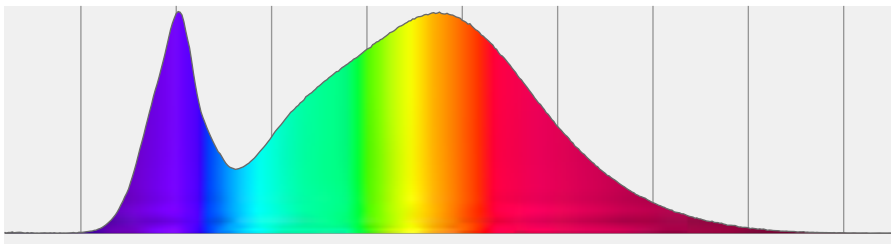
Power: 81.8 W

Efficacy: 46 Lumen/Watt

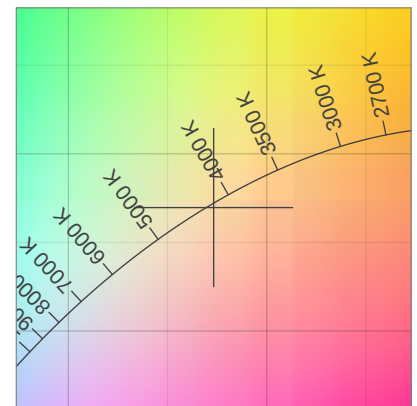
Measurement Date: 3/11/2020



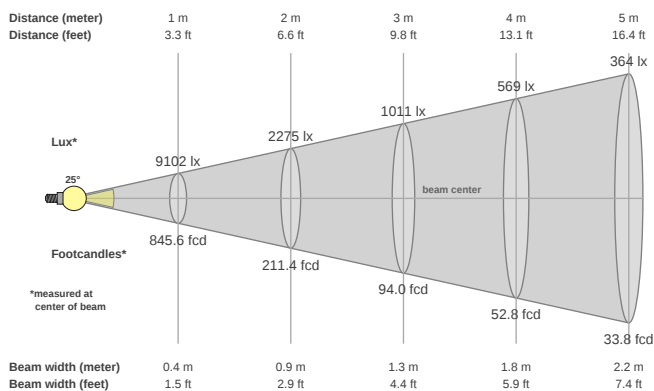
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
582	0.373	0.370	0.223	0.332



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.3°	71.6°	114.4°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
9107 cd	96.6%	84.7%

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	9102	2275	1011	569	364	253	186	142	112	91	75	63	54	46	40	36	31	28	25	23
FC	845.6	211.4	94	52.8	33.8	23.5	17.3	13.2	10.4	8.5	7	5.9	5	4.3	3.8	3.3	2.9	2.6	2.3	2.1