



**KL PAR FC - XWFL**

Photometric Test Report

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# Testing Process

## 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  $2\pi$  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.

## Test Lab Equipment and Process

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 C700T](#)

**Total Lumen Output: 5895 lm**

**Color Temperature: 2717 K**

**CRI: 88.1**

**TLCI: 91**

**TM30: 91.8**

**CQS: 86.6**

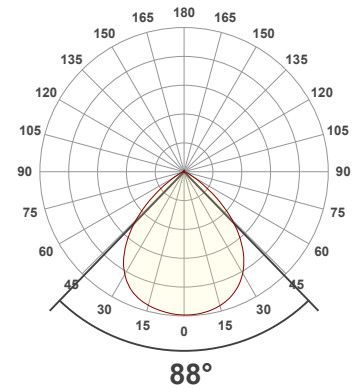
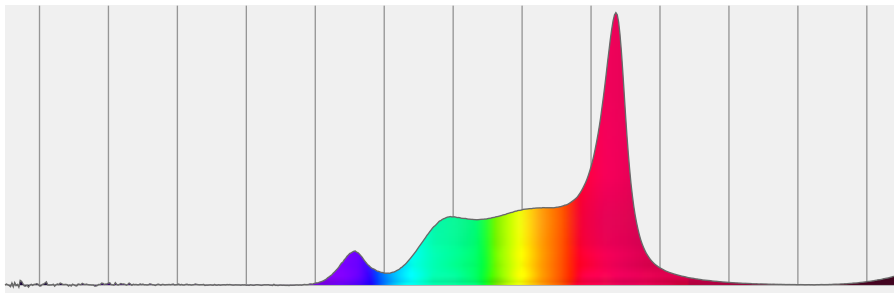
**Measurement Date: 6/29/2021**

**Voltage: 111 V, Current: 2.00 A**

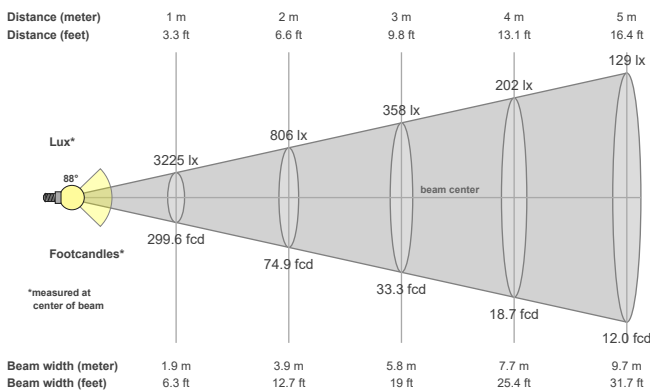
**Power: 219.5 W**

**Efficacy: 27 Lumen/Watt**

**Spectral distribution**  
Dominant Wavelength 583



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>88°</b>	<b>118.6°</b>	<b>139.9°</b>

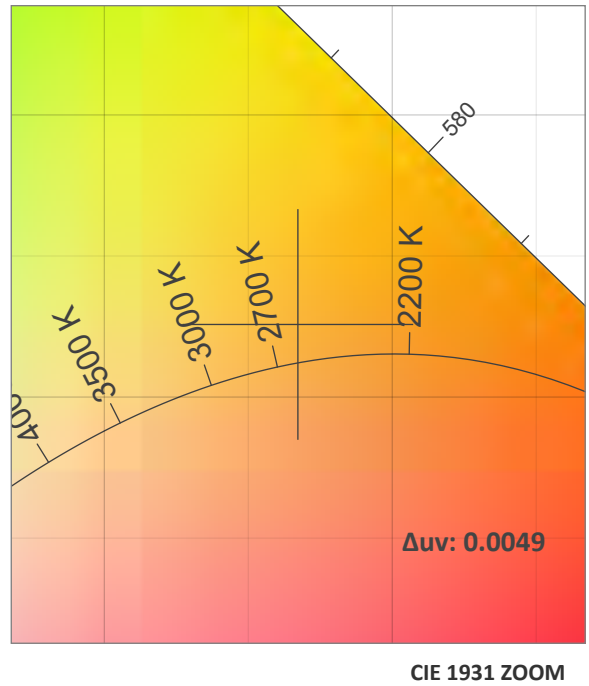
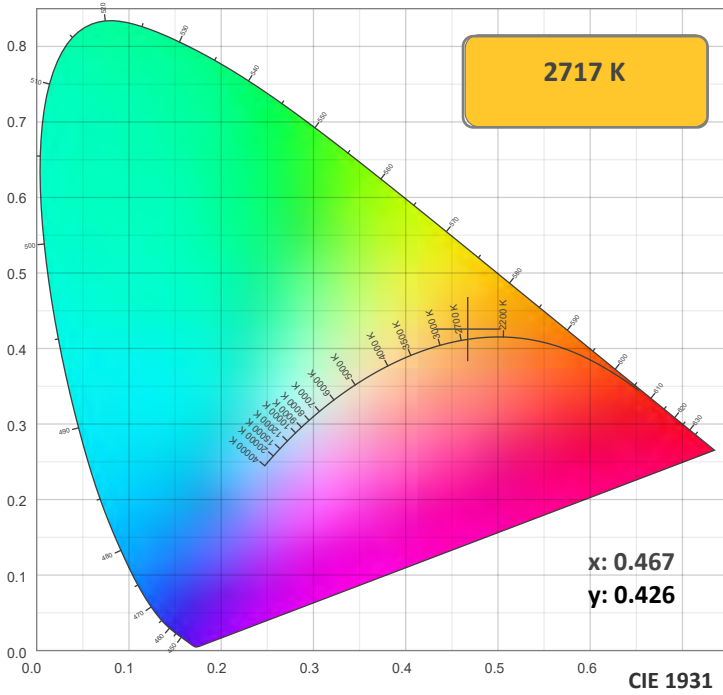
**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>3228 cd</b>	<b>96.2%</b>	<b>78.1%</b>

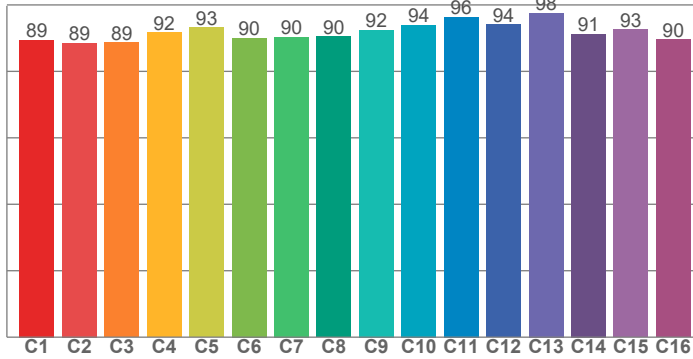
**Beam Intensities from 1-20m**

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>FT</b>	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
<b>LX</b>	3225	806	358	202	129	90	66	50	40	32	27	22	19	16	14	13	11	10	9	8
<b>FC</b>	299.6	74.9	33.3	18.7	12	8.3	6.1	4.7	3.7	3	2.5	2.1	1.8	1.5	1.3	1.2	1	0.9	0.8	0.7

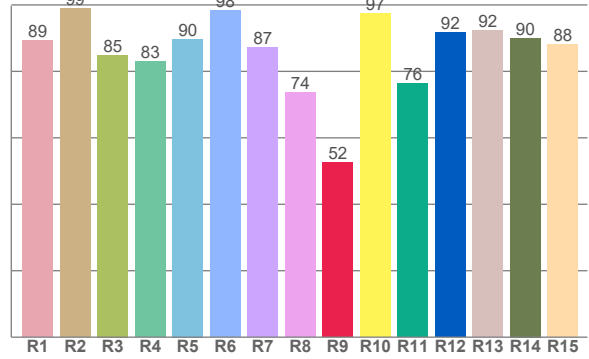
### Color Details



TM30: 91.8



CRI: 88.1 (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
89.3	98.9	84.9	83.1	89.8	98.3	87.2	73.7	52.5	97.4	76.3	91.6	92.3	90.1	88.1

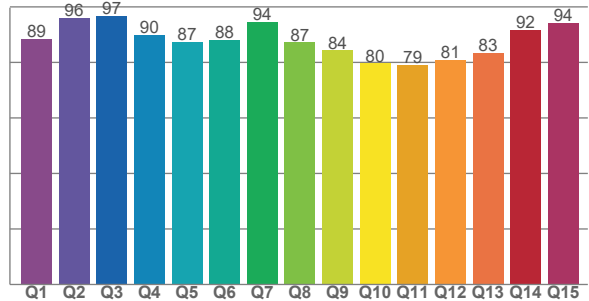
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
89.4	88.5	88.6	91.7	93.3	90.1	90.4	90.5	92.5	94.0	96.3	94.1	97.6	91.2	92.6	89.6

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
88.5	96.0	96.8	89.9	87.2	88.2	94.4	87.2	84.3	79.6	79.0	80.9	83.4	91.6	94.1

CQS: 86.6



### Color Parameters

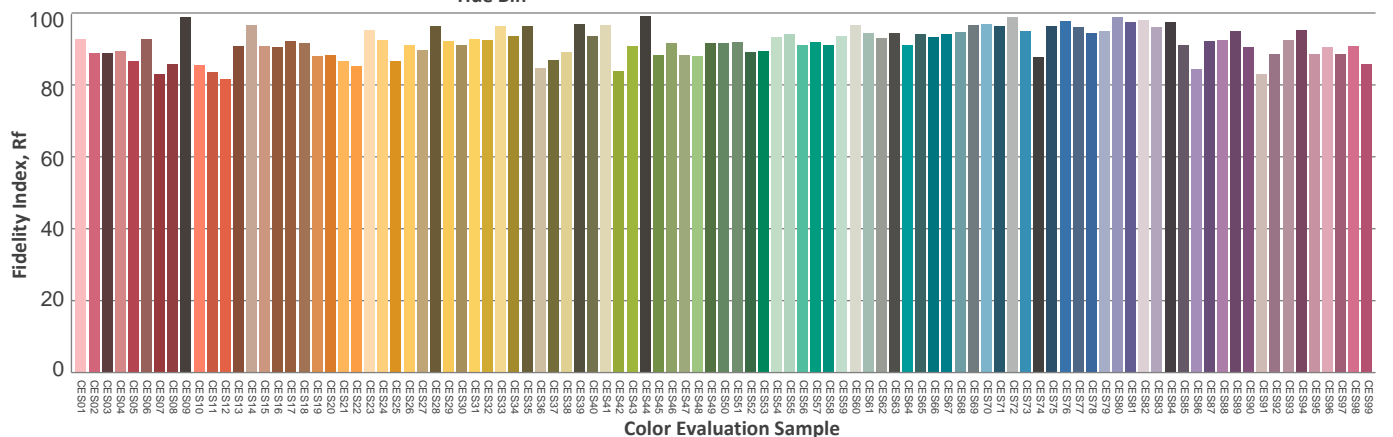
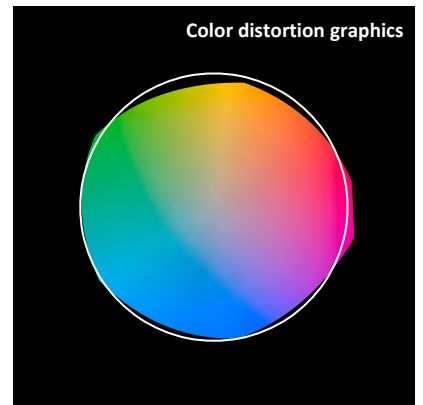
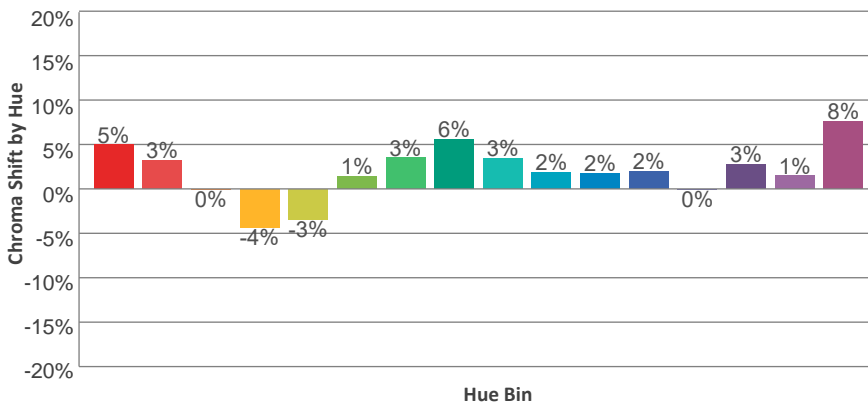
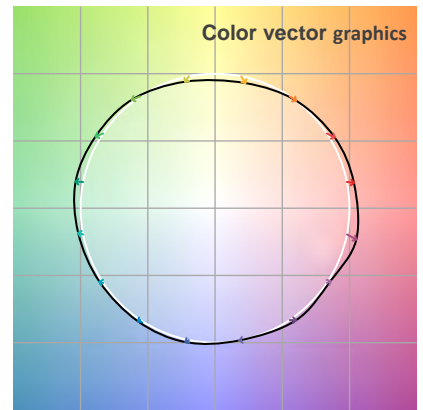
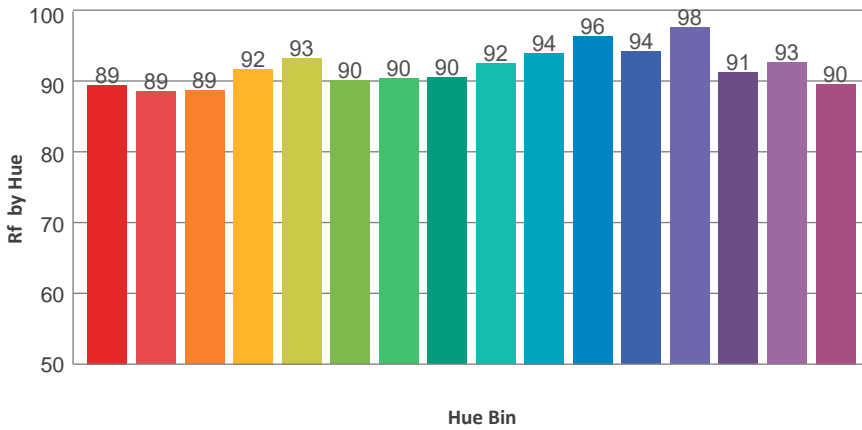
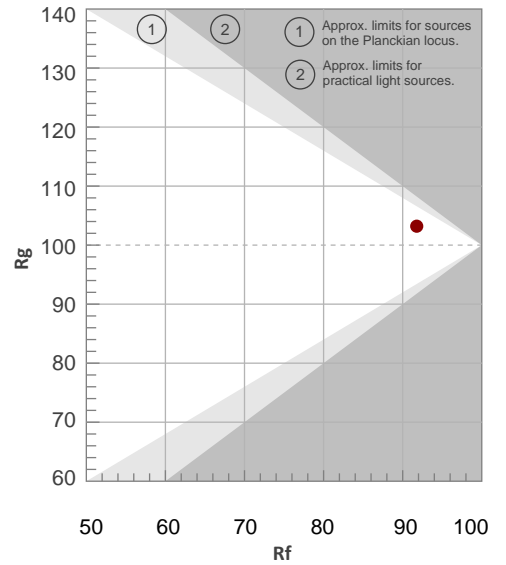
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
2717 K	88.1	52.5	91.8	103.2	86.6	0.467	0.426	0.260	0.356	0.0049

TM30 Details

**Rf 91.8**  
Fidelity Index Rf

**Rg 103.2**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	89	5%	-2%
2	89	3%	-6%
3	89	0%	-6%
4	92	-4%	-4%
5	93	-3%	3%
6	90	1%	7%
7	90	3%	5%
8	90	6%	1%
9	92	3%	-2%
10	94	2%	-2%
11	96	2%	-1%
12	94	2%	-2%
13	98	0%	-1%
14	91	3%	4%
15	93	1%	3%
16	90	8%	-2%



**Total Lumen Output: 6819 lm**

**Color Temperature: 3193 K**

**CRI: 89.9**

**TLCI: 95**

**TM30: 92.7**

**CQS: 91.0**

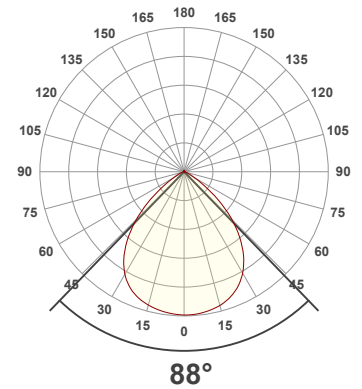
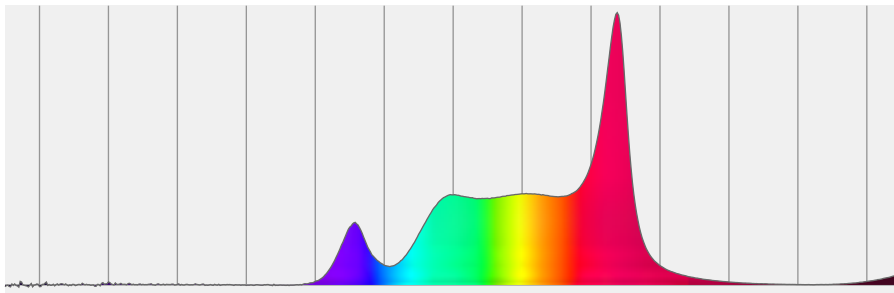
**Measurement Date: 6/29/2021**

**Voltage: 110 V, Current: 2.22 A**

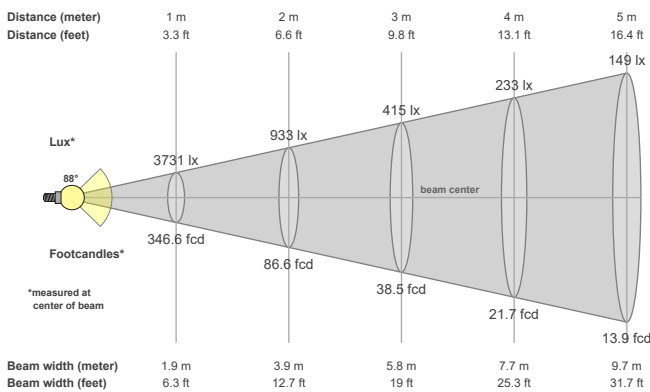
**Power: 242.7 W**

**Efficacy: 28 Lumen/Watt**

**Spectral distribution**  
Dominant Wavelength 581



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>88°</b>	<b>118.5°</b>	<b>140.4°</b>

**Beam intensities**

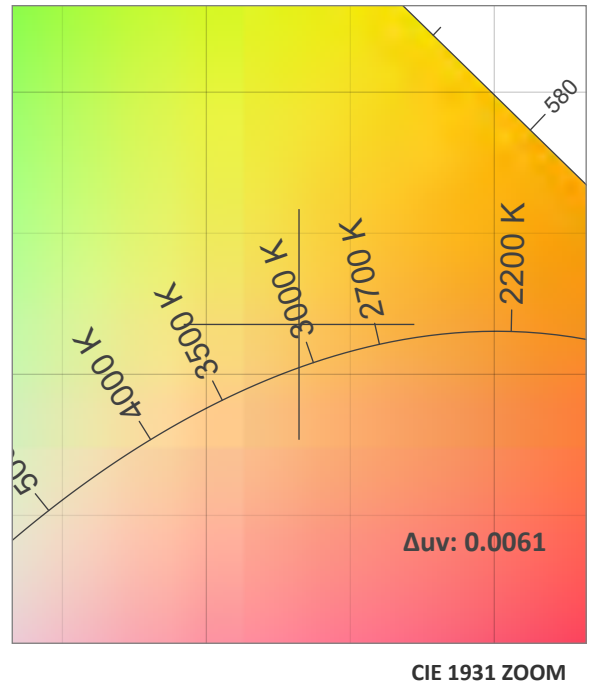
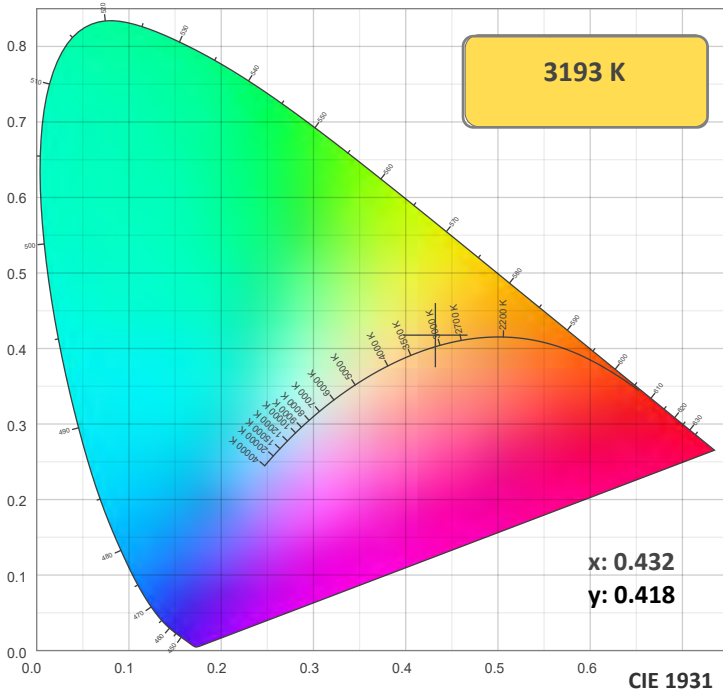
Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>3733 cd</b>	<b>96.0%</b>	<b>78.0%</b>

**Beam Intensities from 1-20m**

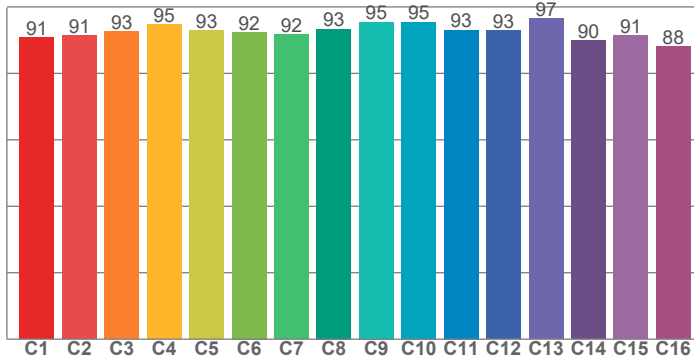
M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>FT</b>	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
<b>LX</b>	3731	933	415	233	149	104	76	58	46	37	31	26	22	19	17	15	13	12	10	9
<b>FC</b>	346.6	86.6	38.5	21.7	13.9	9.6	7.1	5.4	4.3	3.5	2.9	2.4	2.1	1.8	1.5	1.4	1.2	1.1	1	0.9



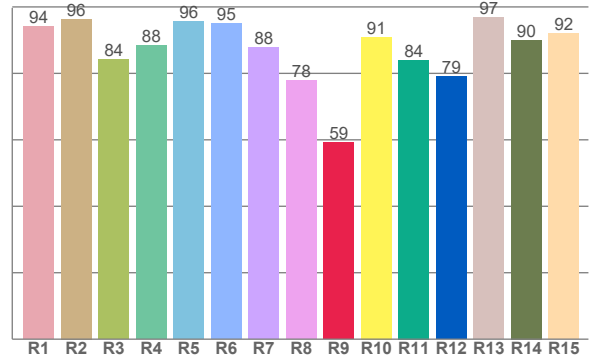
### Color Details



TM30: 92.7



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
94.1	96.4	84.1	88.3	95.6	94.9	87.8	77.9	59.2	90.9	84.0	79.0	96.8	90.0	92.0

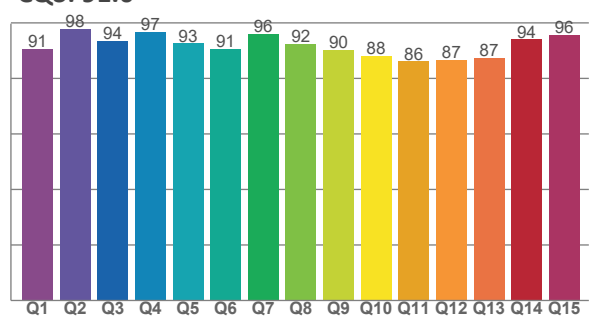
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
90.8	91.5	92.6	94.7	92.9	92.4	91.8	93.3	95.4	95.5	93.1	92.8	96.6	89.8	91.3	88.1

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
90.7	97.9	93.5	96.8	92.6	90.7	95.9	92.4	90.3	88.0	86.1	86.5	87.2	94.0	95.8

CQS: 91.0



### Color Parameters

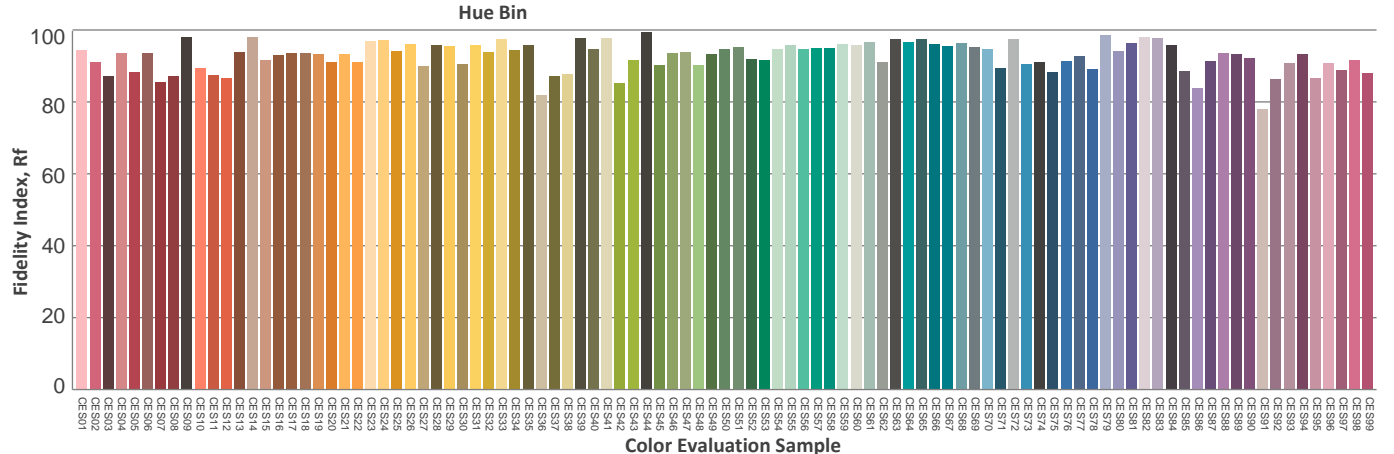
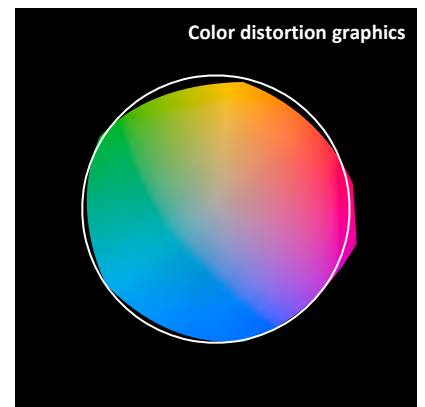
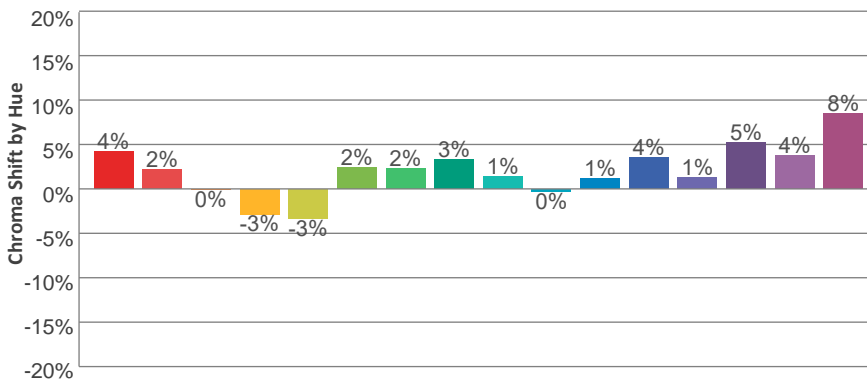
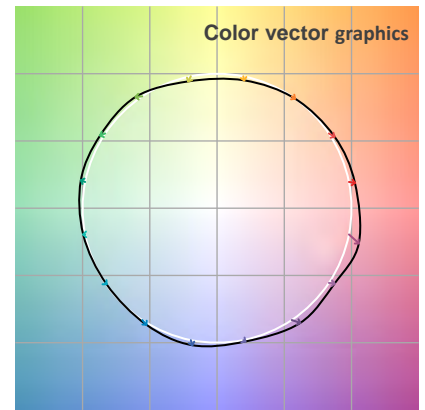
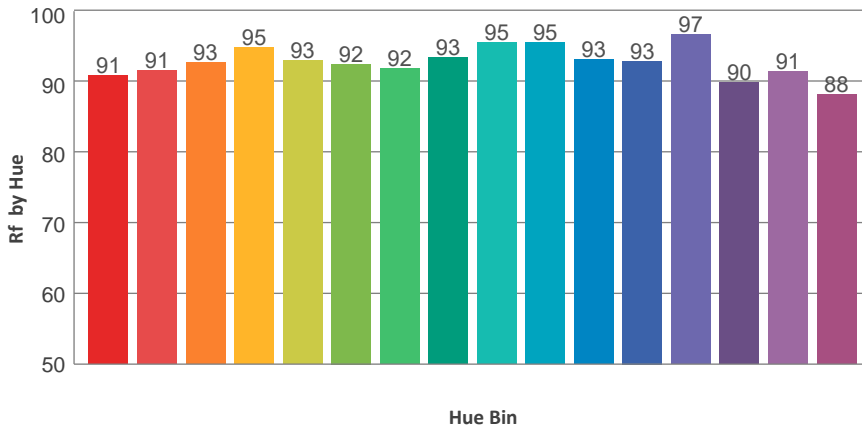
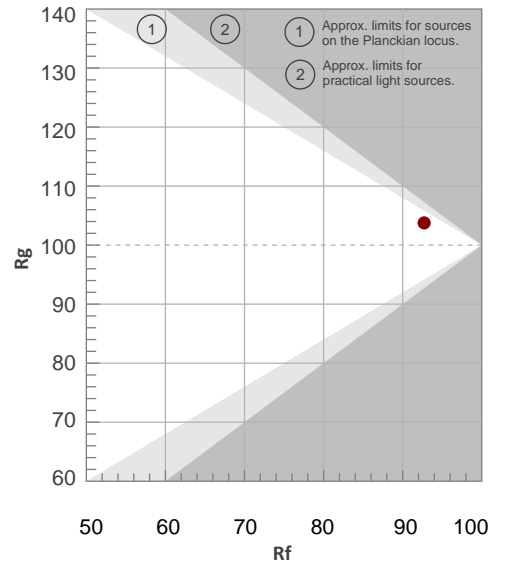
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
3193 K	89.9	59.2	92.7	103.8	91.0	0.432	0.418	0.242	0.351	0.0061

TM30 Details

**Rf 92.7**  
Fidelity Index Rf

**Rg 103.8**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	91	4%	-2%
2	91	2%	-4%
3	93	0%	-3%
4	95	-3%	-1%
5	93	-3%	3%
6	92	2%	4%
7	92	2%	3%
8	93	3%	-1%
9	95	1%	0%
10	95	0%	1%
11	93	1%	4%
12	93	4%	2%
13	97	1%	1%
14	90	5%	4%
15	91	4%	2%
16	88	8%	-5%



**Total Lumen Output: 7804 lm**

**Color Temperature: 4518 K**

**CRI: 91.5**

**TLCI: 94**

**TM30: 91.3**

**CQS: 93.3**

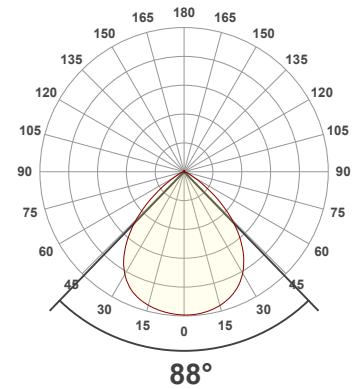
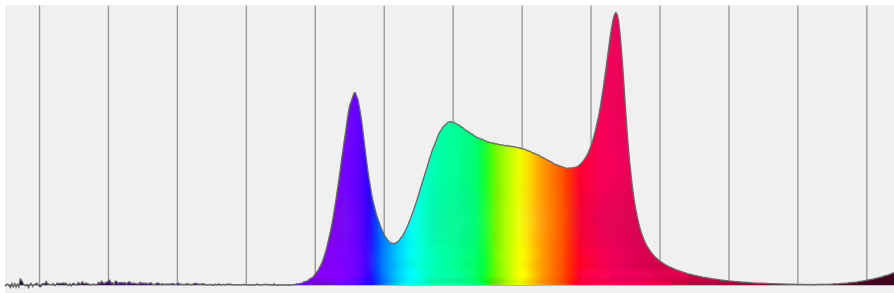
**Measurement Date: 6/29/2021**

**Voltage: 110 V, Current: 2.29 A**

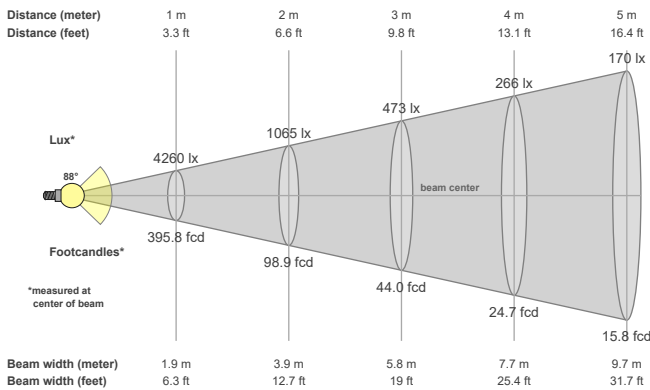
**Power: 251.7 W**

**Efficacy: 31 Lumen/Watt**

**Spectral distribution**  
Dominant Wavelength 576



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
88°	118.7°	140.7°

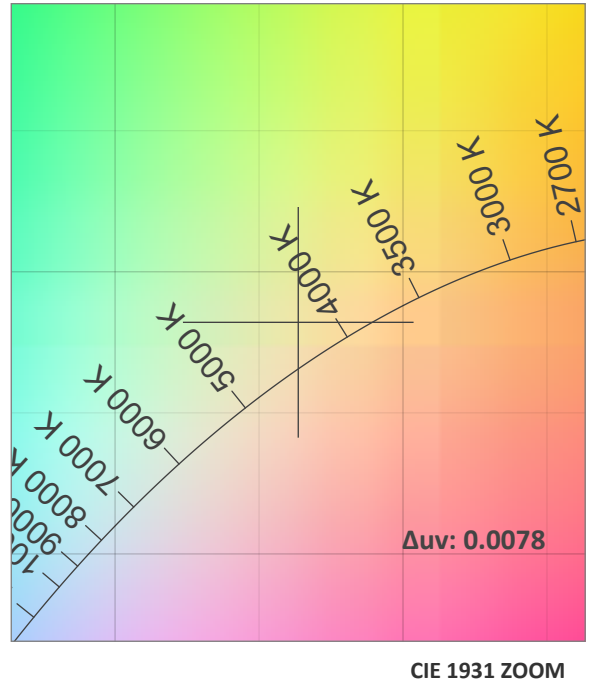
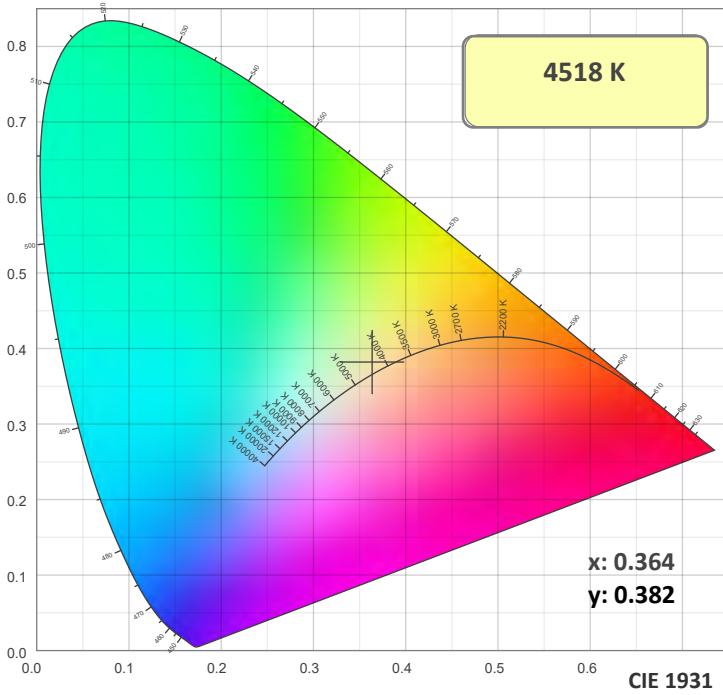
**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
4263 cd	95.9%	77.9%

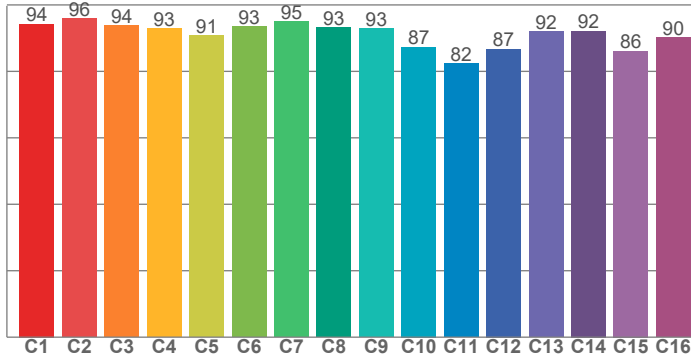
**Beam Intensities from 1-20m**

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	4260	1065	473	266	170	118	87	67	53	43	35	30	25	22	19	17	15	13	12	11
FC	395.8	98.9	44	24.7	15.8	11	8.1	6.2	4.9	4	3.3	2.7	2.3	2	1.8	1.5	1.4	1.2	1.1	1

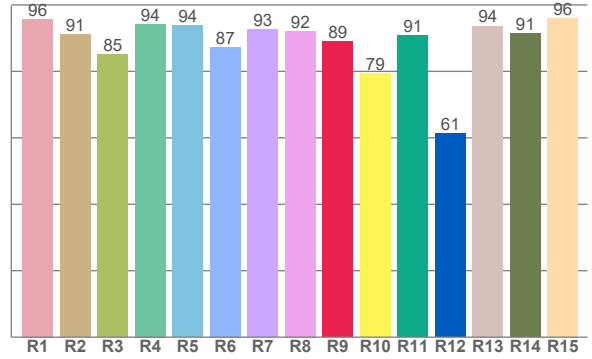
### Color Details



#### TM30: 91.3



#### CRI: 91.5 (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
95.7	91.2	85.1	94.2	93.8	87.4	92.5	92.1	89.1	79.3	90.8	61.3	93.7	91.3	95.9

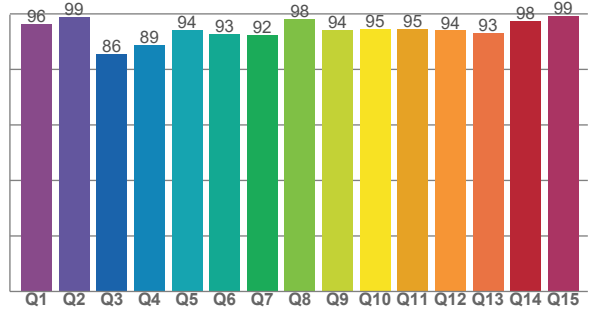
#### TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
94.2	96.0	93.8	92.9	90.9	93.4	94.9	93.2	92.8	87.3	82.5	86.8	92.1	92.1	86.1	90.2

#### CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
96.5	98.9	85.6	88.9	94.1	92.9	92.4	98.2	94.2	94.7	94.6	94.0	93.2	97.5	99.3

#### CQS: 93.3



### Color Parameters

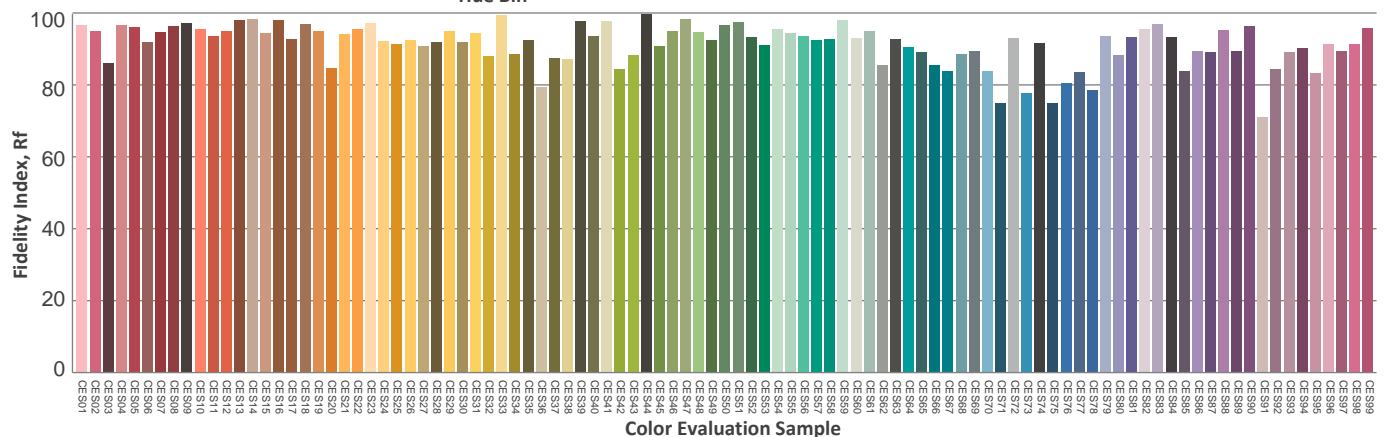
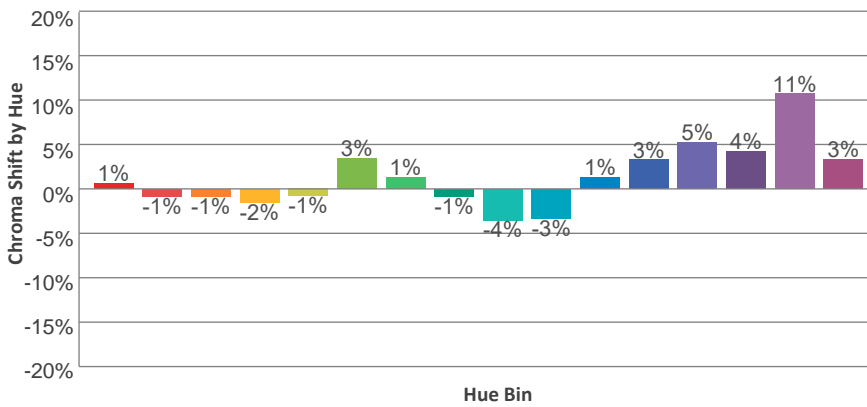
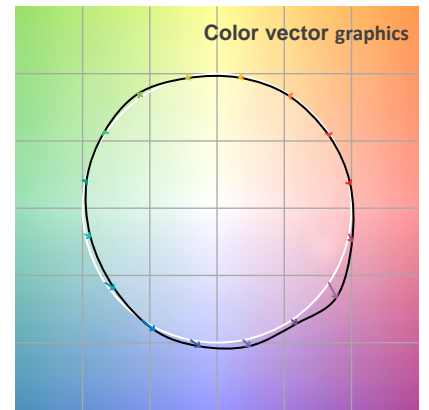
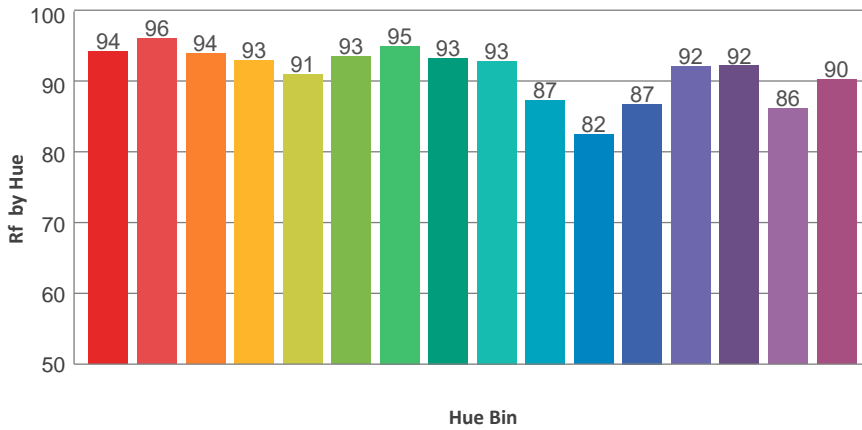
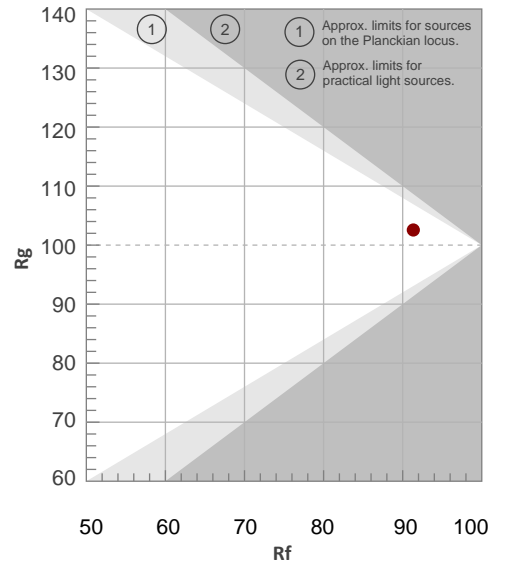
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Division from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
4518 K	91.5	89.1	91.3	102.6	93.3	0.364	0.382	0.212	0.334	0.0078

TM30 Details

**Rf 91.3**  
Fidelity Index Rf

**Rg 102.6**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	94	1%	-2%
2	96	-1%	-2%
3	94	-1%	2%
4	93	-2%	3%
5	91	-1%	3%
6	93	3%	2%
7	95	1%	-1%
8	93	-1%	-1%
9	93	-4%	2%
10	87	-3%	7%
11	82	1%	11%
12	87	3%	7%
13	92	5%	4%
14	92	4%	1%
15	86	11%	-6%
16	90	3%	-4%



**Total Lumen Output: 7636 lm**

**Color Temperature: 5583 K**

**CRI: 91.2**

**TLCI: 94**

**TM30: 90.5**

**CQS: 92.5**

**Measurement Date: 6/29/2021**

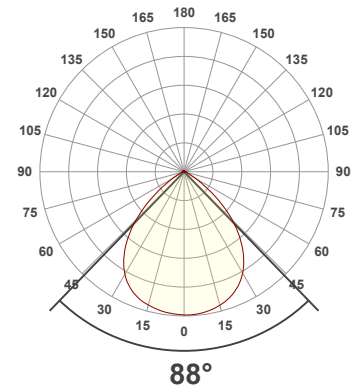
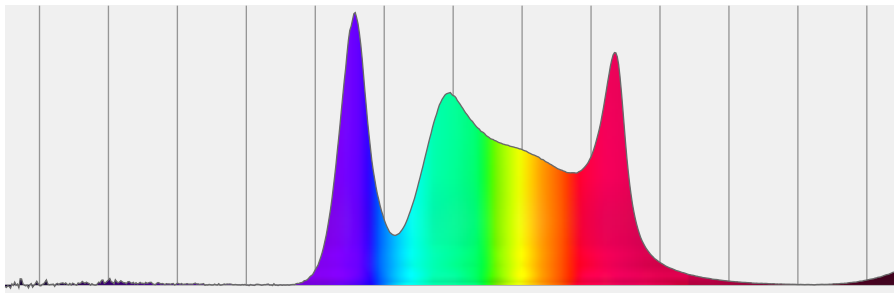
**Voltage: 110 V, Current: 2.35 A**

**Power: 256.4 W**

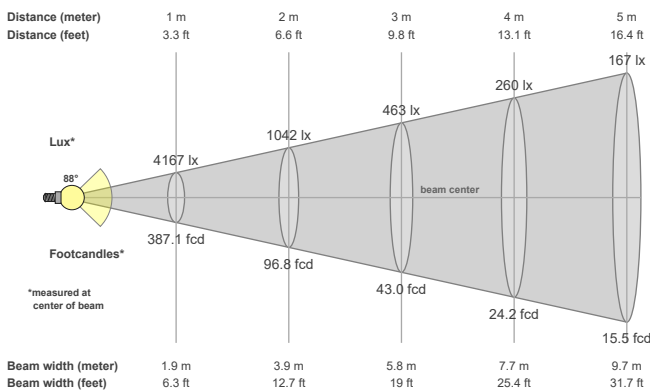
**Efficacy: 30 Lumen/Watt**

**Spectral distribution**

Dominant Wavelength 571



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>88°</b>	<b>119°</b>	<b>140.6°</b>

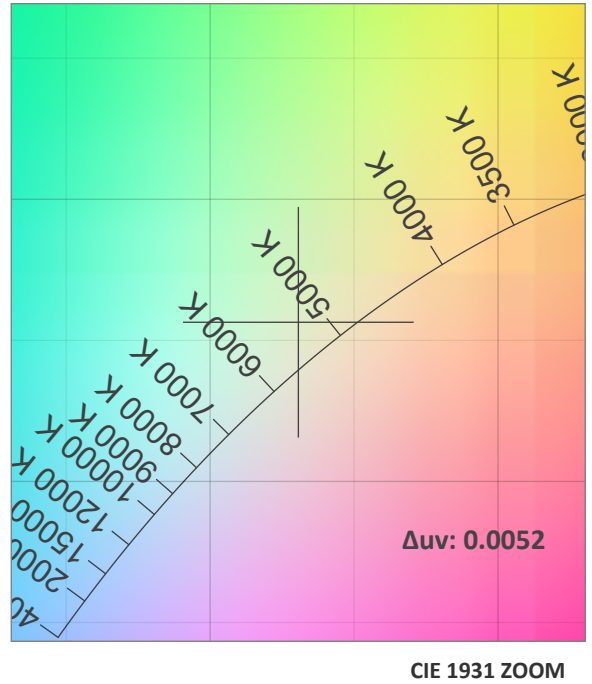
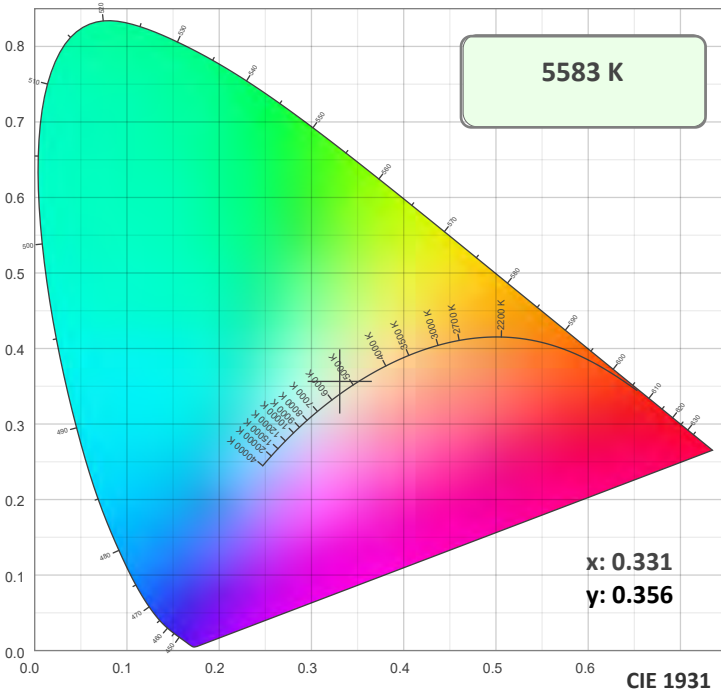
**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>4173 cd</b>	<b>96.0%</b>	<b>78.0%</b>

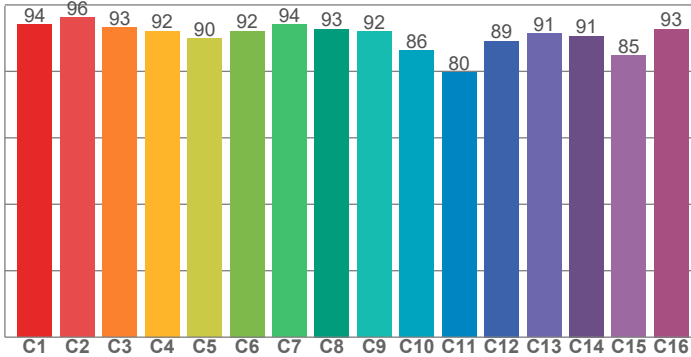
**Beam Intensities from 1-20m**

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>FT</b>	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
<b>LX</b>	4167	1042	463	260	167	116	85	65	51	42	34	29	25	21	19	16	14	13	12	10
<b>FC</b>	387.1	96.8	43	24.2	15.5	10.8	7.9	6	4.8	3.9	3.2	2.7	2.3	2	1.7	1.5	1.3	1.2	1.1	1

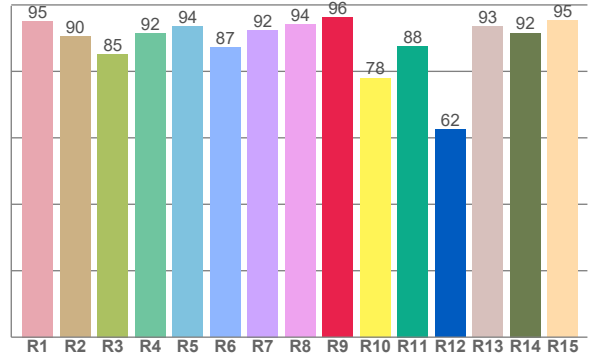
### Color Details



**TM30: 90.5**



**CRI: 91.2 (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
95.2	90.5	85.2	91.5	93.5	87.2	92.4	94.2	96.2	78.0	87.6	62.4	93.4	91.6	95.3

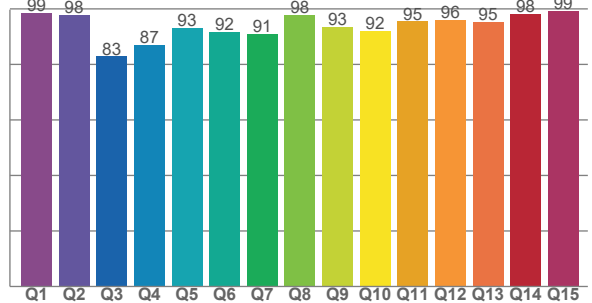
**TM30 C Values, 16 binned values out of total of 99 C values**

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
94.1	96.2	93.2	92.1	89.8	92.2	94.1	92.7	92.0	86.2	79.7	89.2	91.3	90.7	84.7	92.7

**CQS Q Values**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.7	97.8	82.8	86.9	93.1	91.6	91.1	97.9	93.4	92.1	95.5	96.0	95.3	98.1	99.3

**CQS: 92.5**



**Color Parameters**

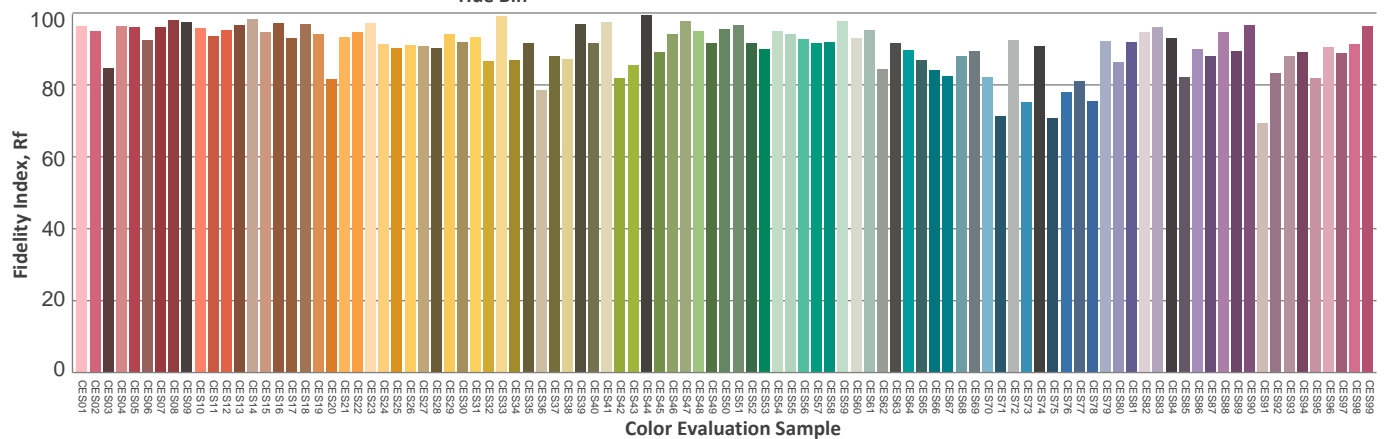
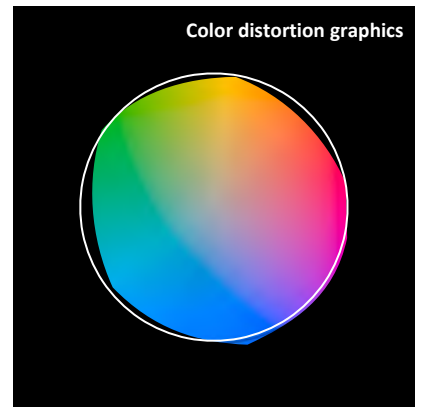
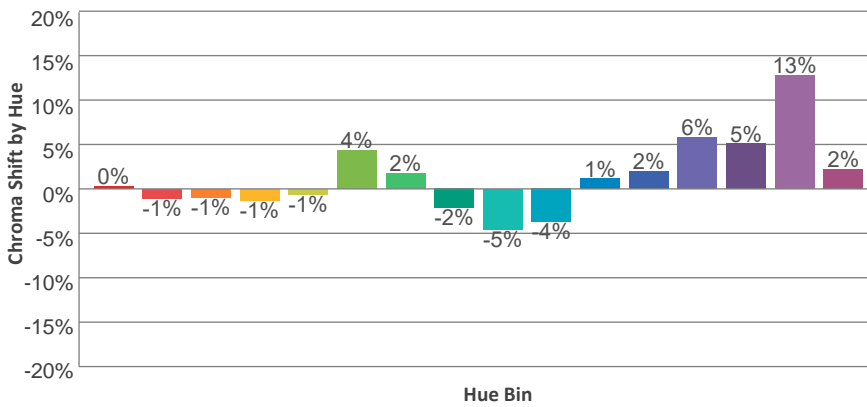
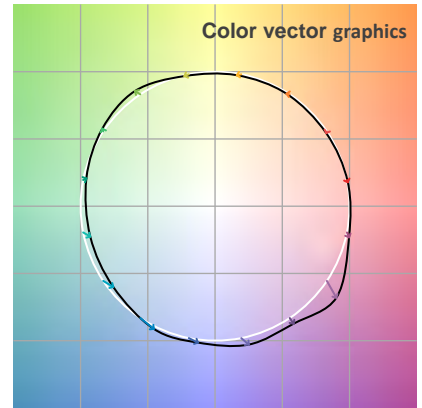
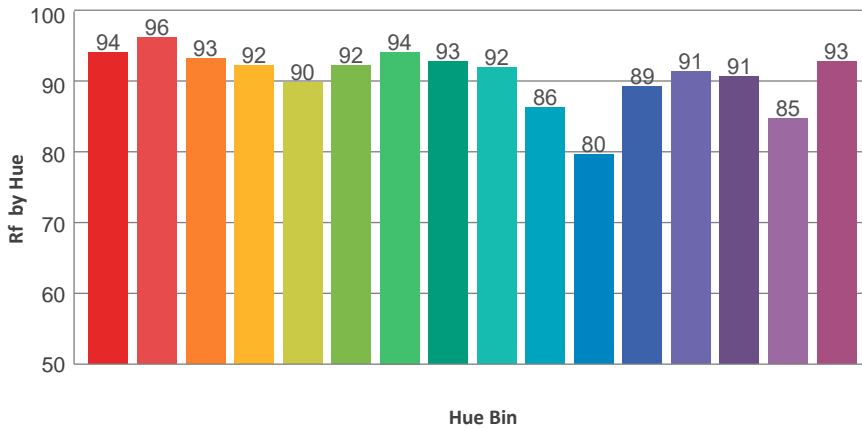
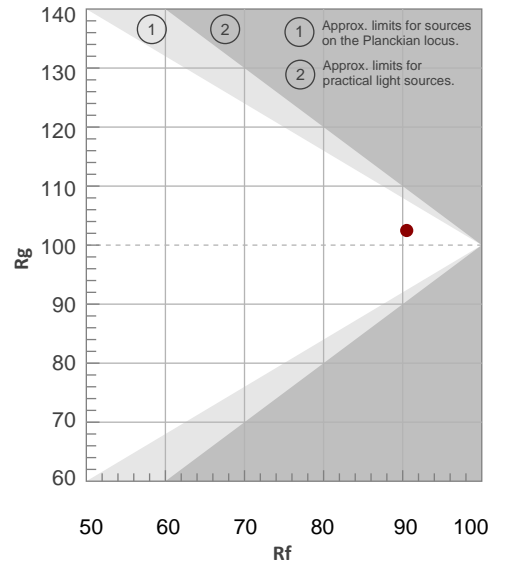
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
5583 K	91.2	96.2	90.5	102.5	92.5	0.331	0.356	0.200	0.323	0.0052

TM30 Details

**Rf 90.5**  
Fidelity Index Rf

**Rg 102.5**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	94	0%	-2%
2	96	-1%	-1%
3	93	-1%	2%
4	92	-1%	3%
5	90	-1%	3%
6	92	4%	2%
7	94	2%	-1%
8	93	-2%	-2%
9	92	-5%	4%
10	86	-4%	8%
11	80	1%	13%
12	89	2%	7%
13	91	6%	5%
14	91	5%	0%
15	85	13%	-6%
16	93	2%	-3%





**Total Lumen Output: 7652 lm**

**Color Temperature: 6022 K**

**CRI: 91.2**

**TLCI: 94**

**TM30: 90.3**

**CQS: 92.6**

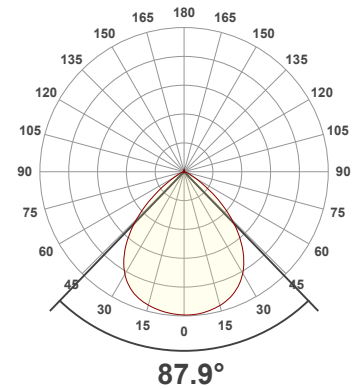
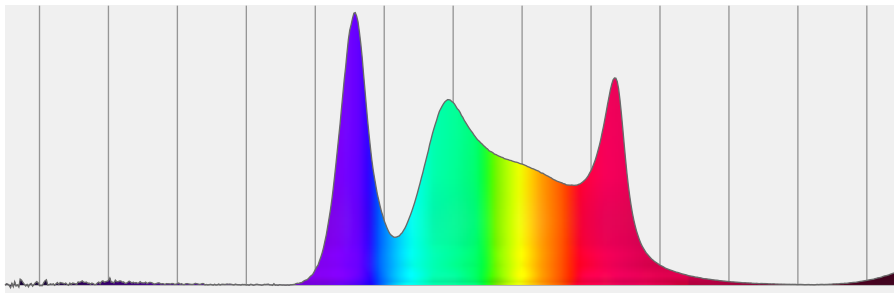
**Measurement Date: 6/29/2021**

**Voltage: 110 V, Current: 2.29 A**

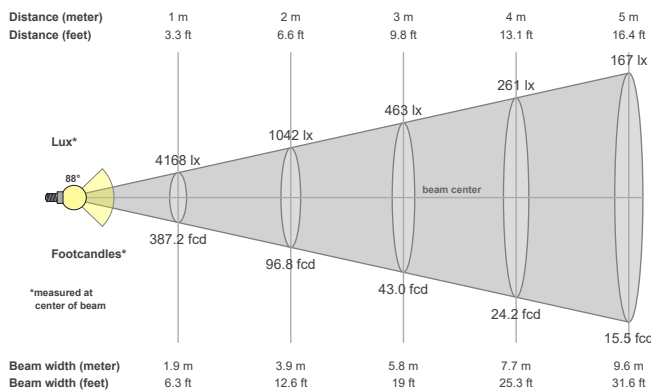
**Power: 251.1 W**

**Efficacy: 30 Lumen/Watt**

**Spectral distribution**  
Dominant Wavelength 566



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>87.9°</b>	<b>119.4°</b>	<b>141.2°</b>

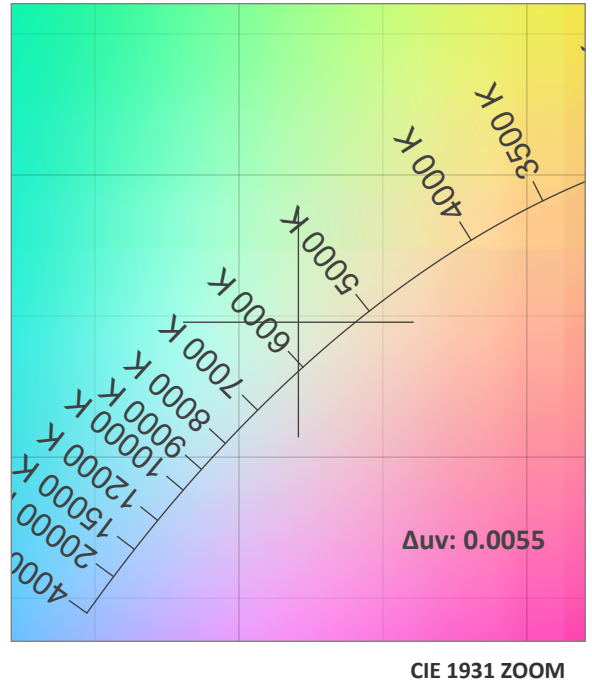
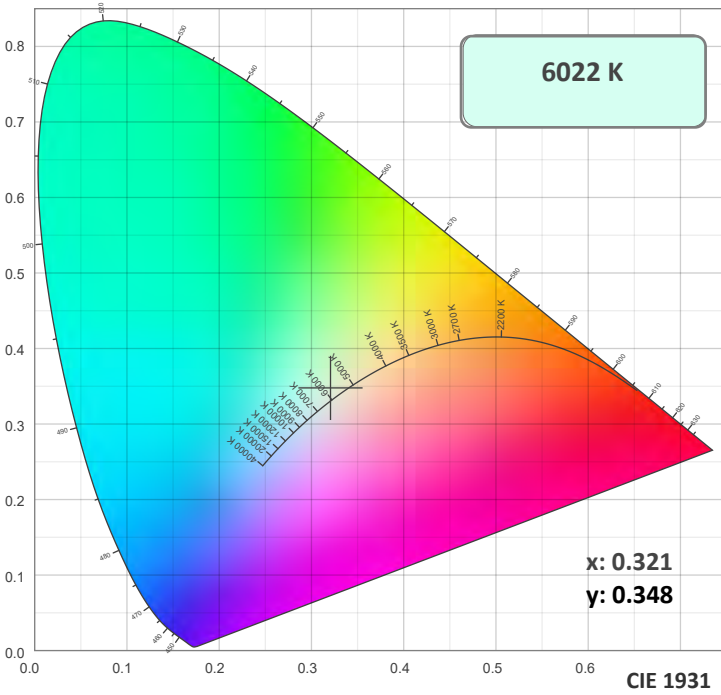
**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>4173 cd</b>	<b>95.9%</b>	<b>77.8%</b>

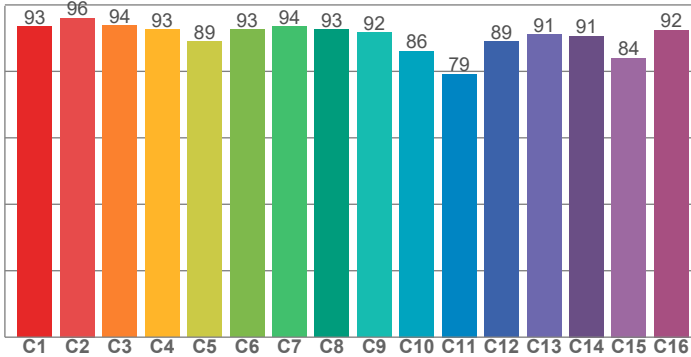
**Beam Intensities from 1-20m**

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>FT</b>	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
<b>LX</b>	4168	1042	463	261	167	116	85	65	51	42	34	29	25	21	19	16	14	13	12	10
<b>FC</b>	387.2	96.8	43	24.2	15.5	10.8	7.9	6.1	4.8	3.9	3.2	2.7	2.3	2	1.7	1.5	1.3	1.2	1.1	1

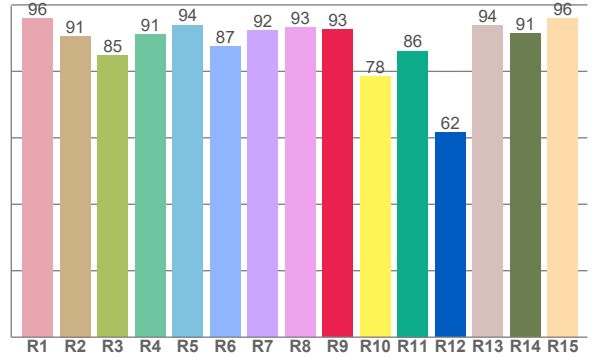
### Color Details



**TM30: 90.3**



**CRI: 91.2 (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
95.8	90.6	84.8	91.1	94.0	87.5	92.3	93.3	92.6	78.4	86.2	61.7	93.9	91.5	95.9

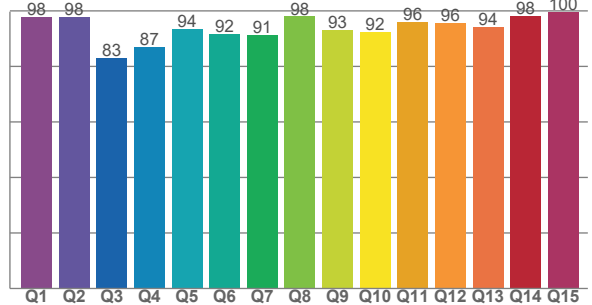
**TM30 C Values, 16 binned values out of total of 99 C values**

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
93.5	96.0	93.7	92.6	89.0	92.7	93.6	92.6	91.7	86.1	79.2	89.0	91.0	90.7	84.1	92.5

**CQS Q Values**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
97.9	97.7	83.0	87.2	93.6	91.8	91.4	98.0	93.1	92.4	95.9	95.7	94.3	98.2	99.8

**CQS: 92.6**



**Color Parameters**

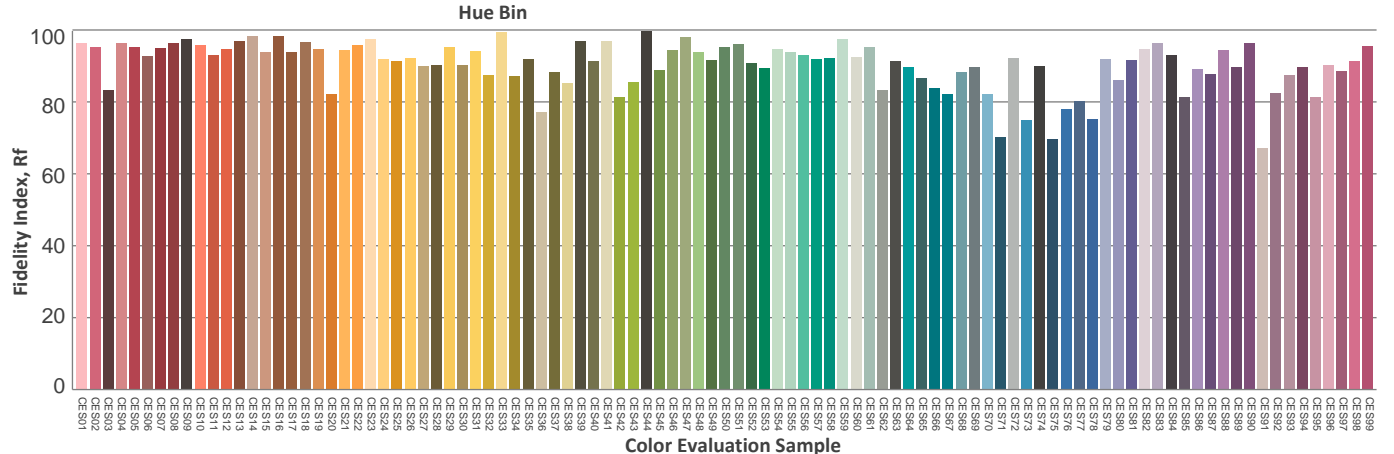
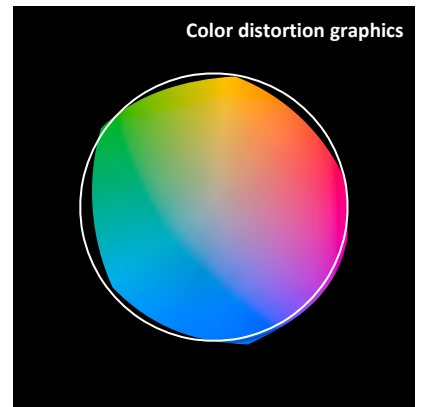
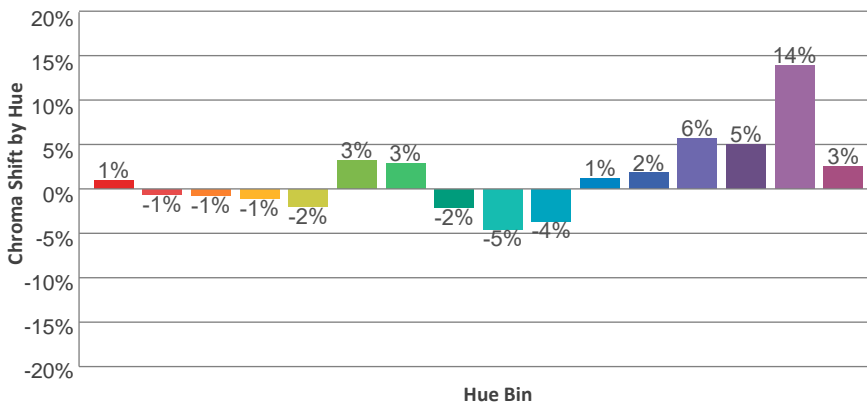
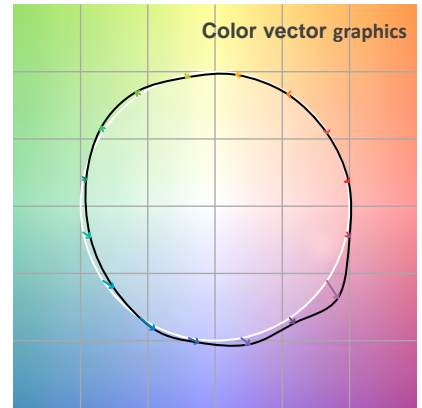
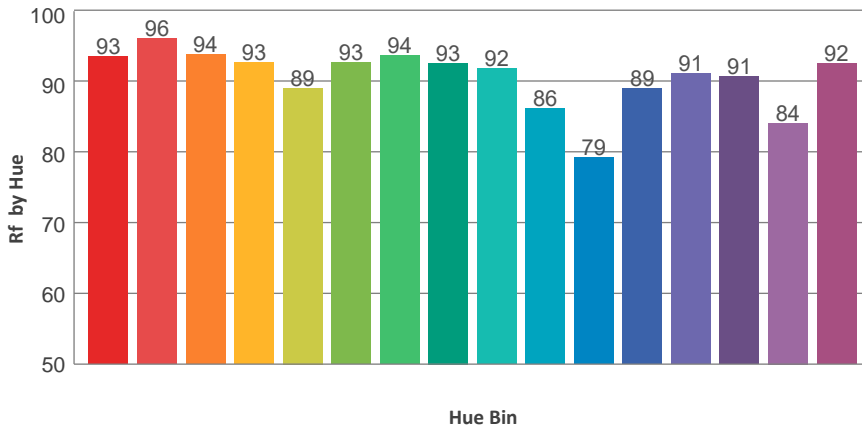
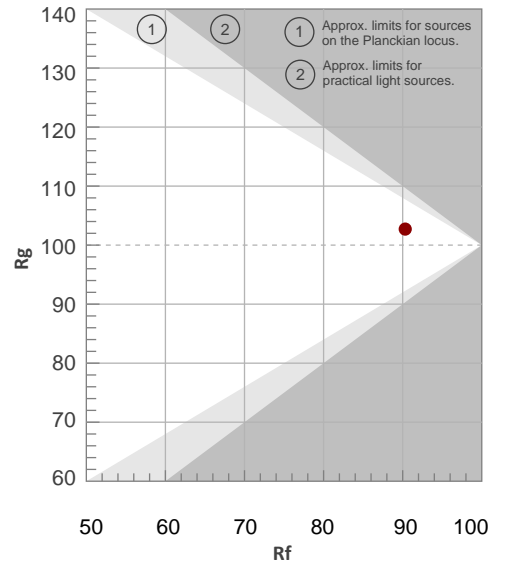
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
6022 K	91.2	92.6	90.3	102.7	92.6	0.321	0.348	0.196	0.319	0.0055

TM30 Details

**Rf 90.3**  
Fidelity Index Rf

**Rg 102.7**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	93	1%	-2%
2	96	-1%	-1%
3	94	-1%	2%
4	93	-1%	3%
5	89	-2%	3%
6	93	3%	2%
7	94	3%	-2%
8	93	-2%	-1%
9	92	-5%	4%
10	86	-4%	8%
11	79	1%	13%
12	89	2%	7%
13	91	6%	5%
14	91	5%	1%
15	84	14%	-6%
16	92	3%	-3%



**Total Lumen Output: 8180 lm**

**Color Temperature: 6535 K**

**CRI: 91.1**

**TLCI: 94**

**TM30: 89.8**

**CQS: 92.1**

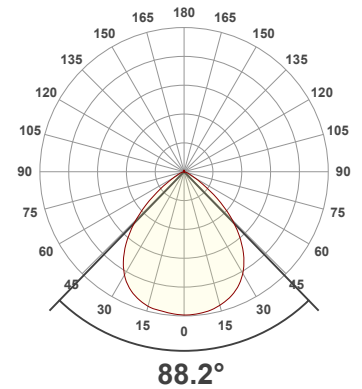
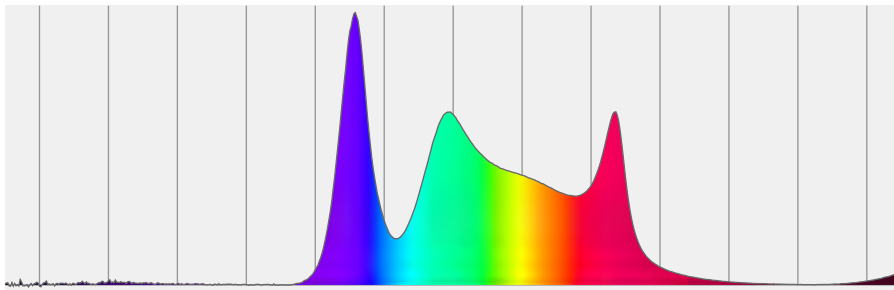
**Measurement Date: 6/29/2021**

**Voltage: 109 V, Current: 2.51 A**

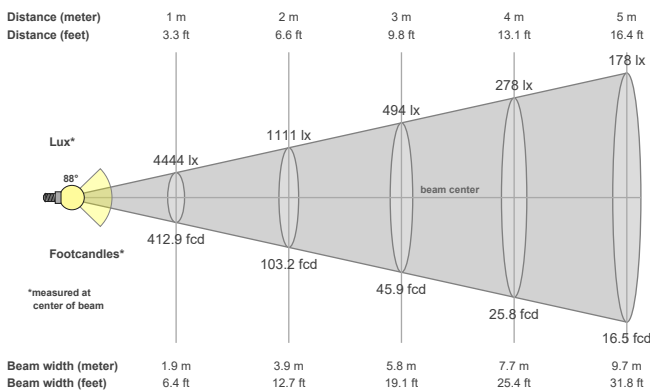
**Power: 273 W**

**Efficacy: 30 Lumen/Watt**

**Spectral distribution**  
Dominant Wavelength 540



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>88.2°</b>	<b>118.9°</b>	<b>140.8°</b>

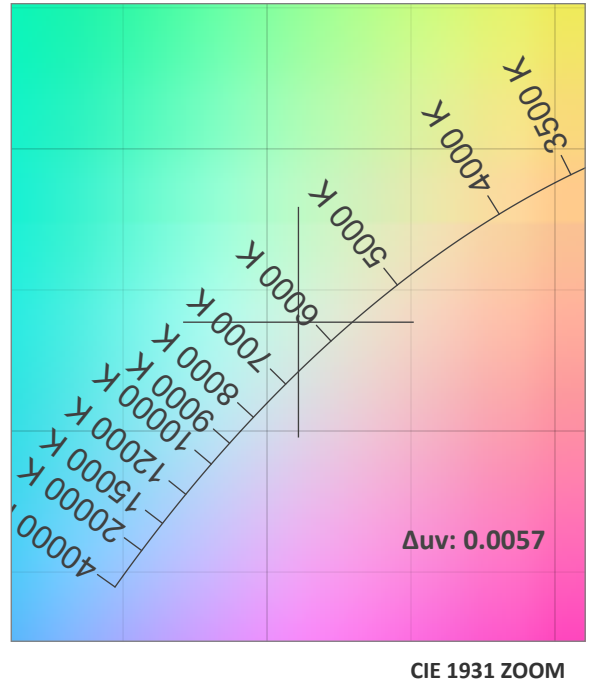
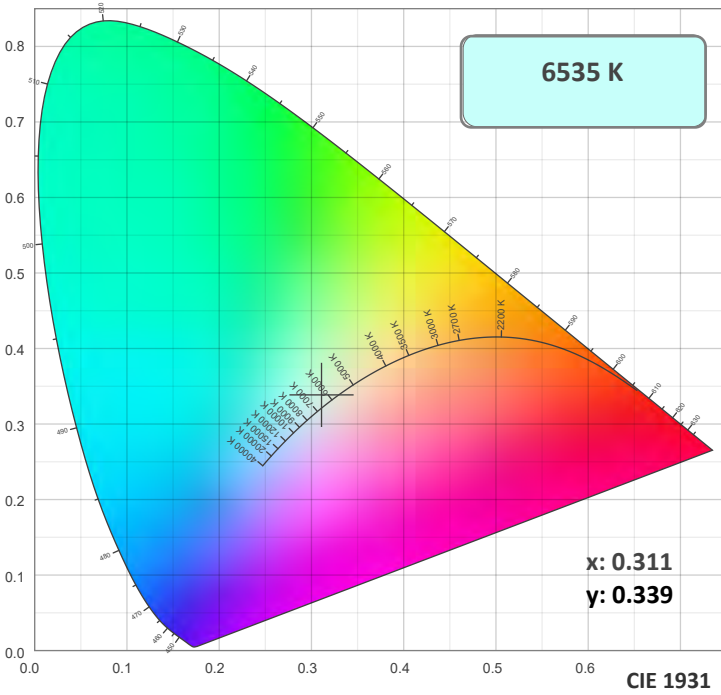
**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>4448 cd</b>	<b>95.9%</b>	<b>77.8%</b>

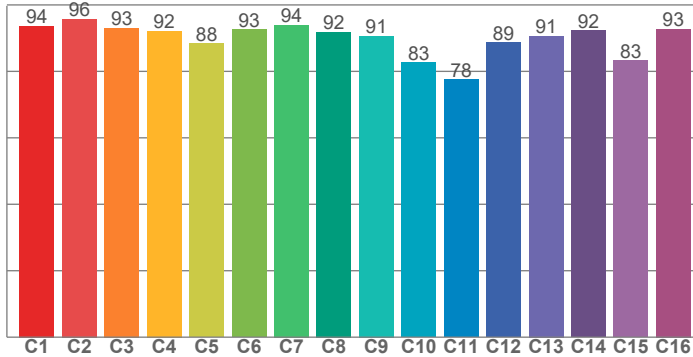
**Beam Intensities from 1-20m**

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>FT</b>	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
<b>LX</b>	4444	1111	494	278	178	123	91	69	55	44	37	31	26	23	20	17	15	14	12	11
<b>FC</b>	412.9	103.2	45.9	25.8	16.5	11.5	8.4	6.5	5.1	4.1	3.4	2.9	2.4	2.1	1.8	1.6	1.4	1.3	1.1	1

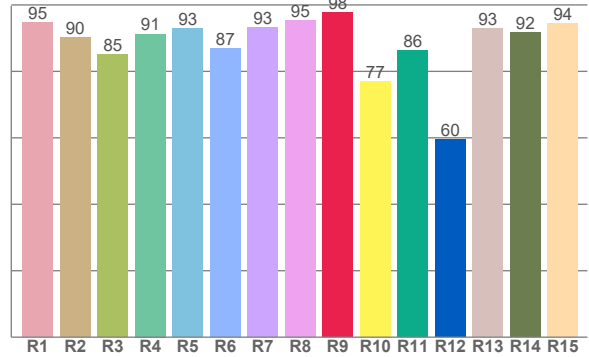
### Color Details



**TM30: 89.8**



**CRI: 91.1 (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
94.6	90.1	85.1	91.3	92.9	86.8	93.1	95.2	97.6	77.1	86.2	59.5	92.9	91.7	94.3

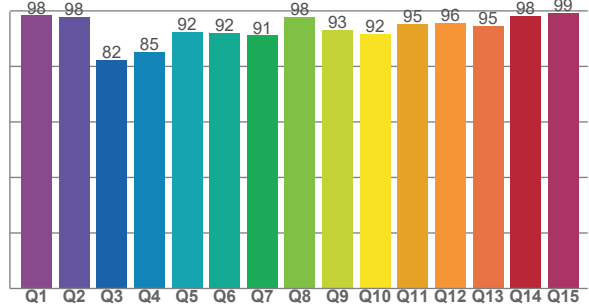
**TM30 C Values, 16 binned values out of total of 99 C values**

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
93.7	95.8	93.1	92.2	88.4	92.6	94.0	91.8	90.7	82.6	77.6	88.7	90.7	92.3	83.2	92.8

**CQS Q Values**

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
98.4	97.8	82.3	85.3	92.4	92.0	91.1	97.7	93.2	91.7	95.4	95.7	94.7	98.2	99.4

**CQS: 92.1**



### Color Parameters

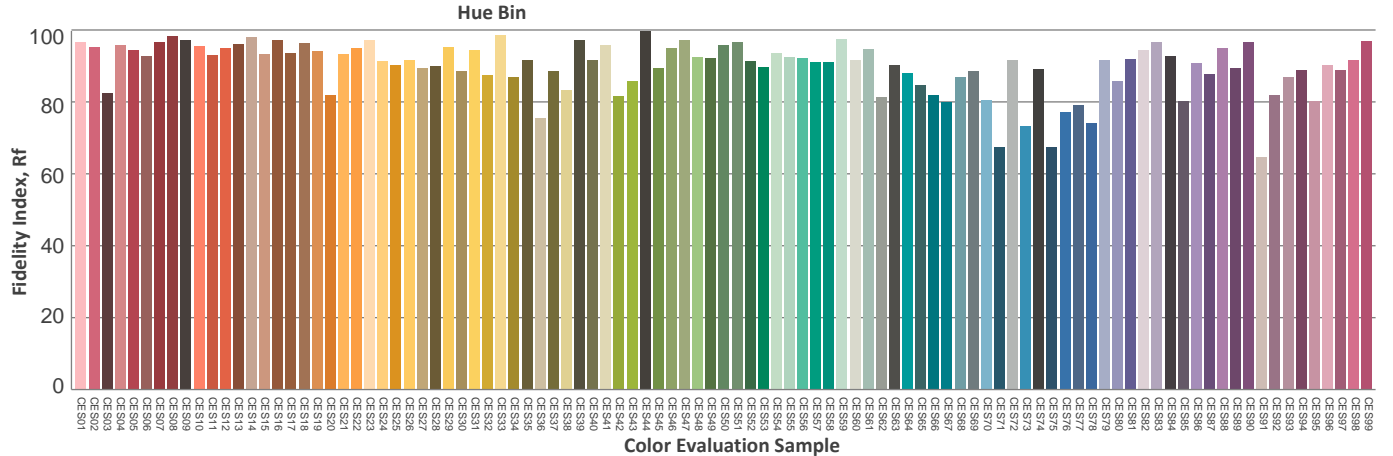
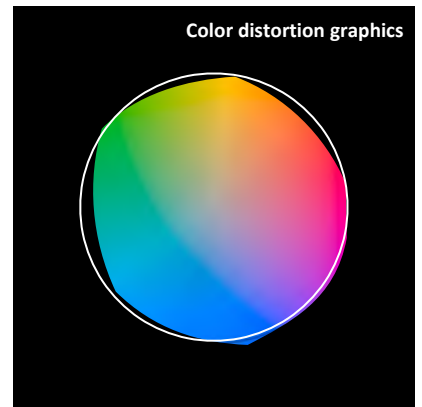
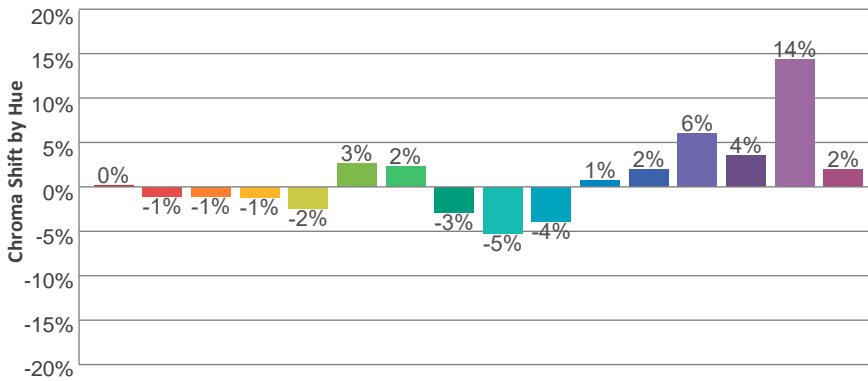
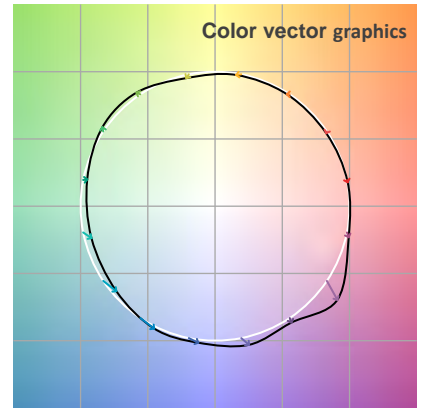
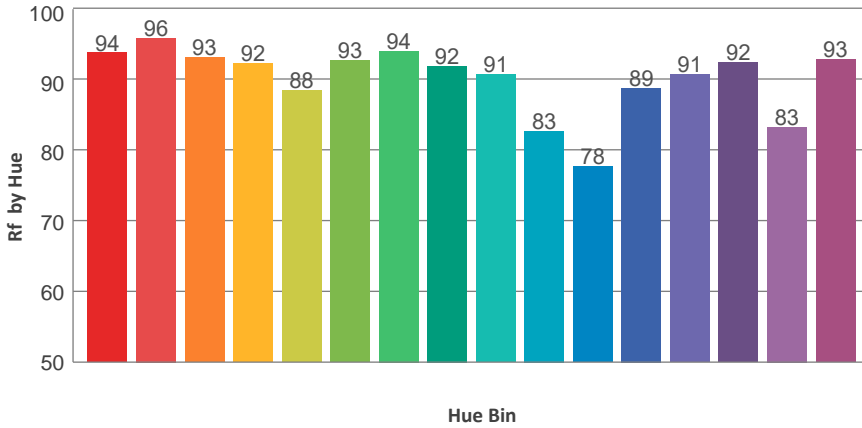
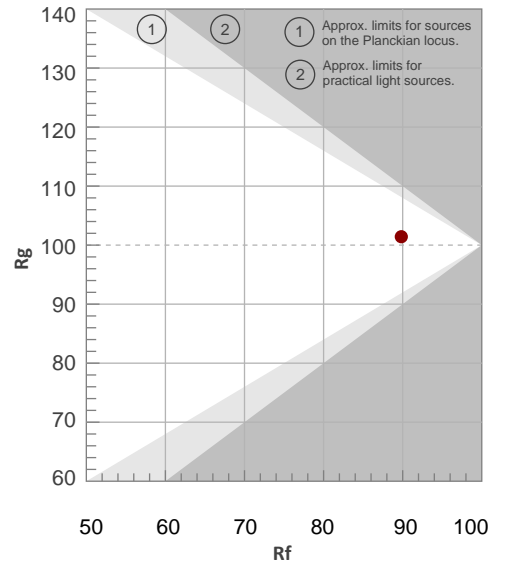
Color Temperature	Color Rendering Index	Red Component	Color Fidelity	Color Gamut	Color Quality Scale	Color Coordinate CIE 1931	Color Coordinate CIE 1931	Color Coordinate	Color Coordinate	Color Diviation from Black
CCT	CRI	CRI R9	TM30 Rf	TM30 Rg	CQS	x	y	u	v	Δuv
6535 K	91.1	97.6	89.8	101.4	92.1	0.311	0.339	0.193	0.315	0.0057

TM30 Details

**Rf 89.8**  
Fidelity Index Rf

**Rg 101.4**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	94	0%	-2%
2	96	-1%	-1%
3	93	-1%	2%
4	92	-1%	4%
5	88	-2%	2%
6	93	3%	2%
7	94	2%	-2%
8	92	-3%	-1%
9	91	-5%	5%
10	83	-4%	12%
11	78	1%	13%
12	89	2%	8%
13	91	6%	5%
14	92	4%	-1%
15	83	14%	-7%
16	93	2%	-3%



**Total Lumen Output: 8727 lm**

**Color Temperature: 6252 K**

**CRI: 90.7**

**TLCI: 92**

**TM30: 89.1**

**CQS: 91.4**

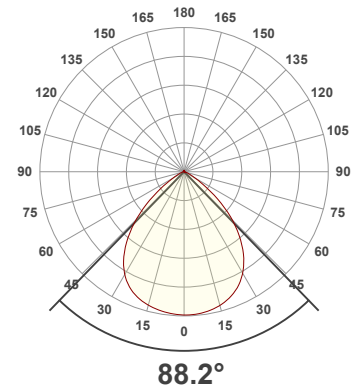
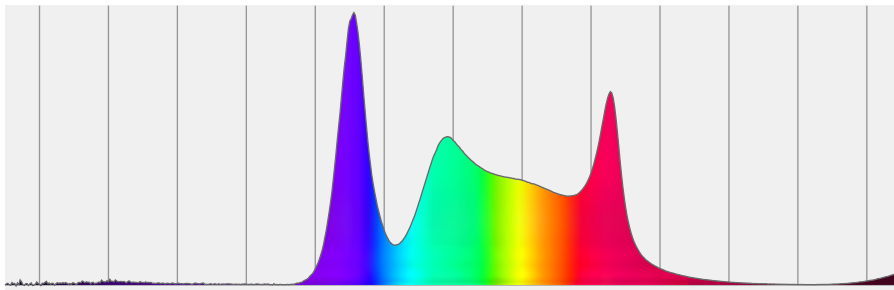
**Measurement Date: 6/29/2021**

**Voltage: 114 V, Current: 2.46 A**

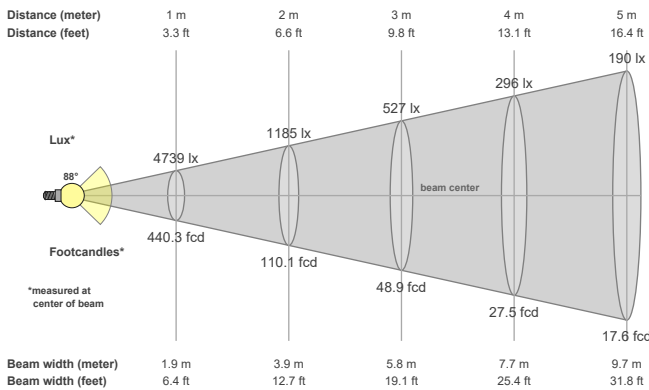
**Power: 280 W**

**Efficacy: 31 Lumen/Watt**

**Spectral distribution**  
Dominant Wavelength 829



**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>88.2°</b>	<b>119°</b>	<b>141.2°</b>

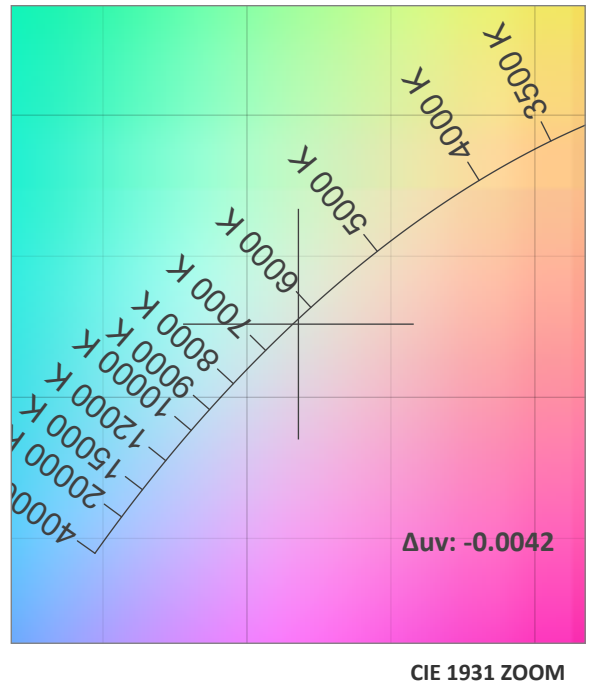
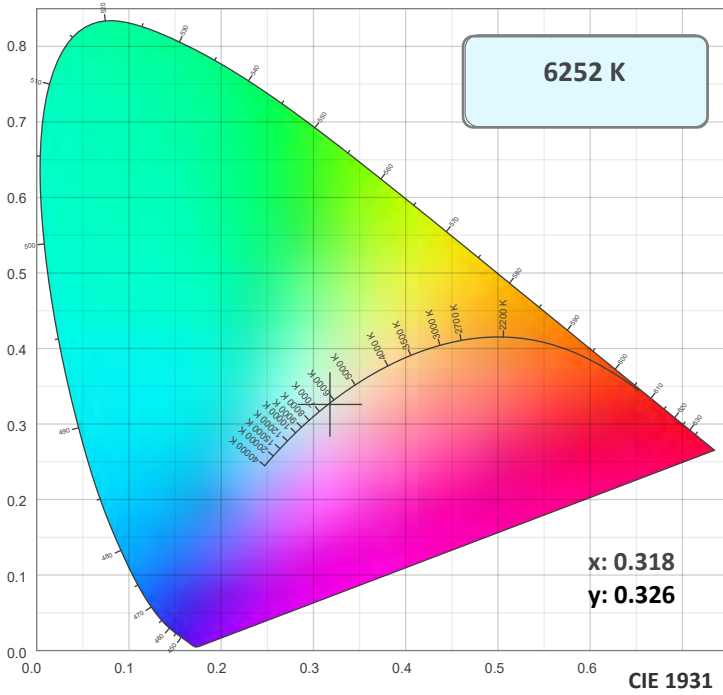
**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>4743 cd</b>	<b>95.7%</b>	<b>77.5%</b>

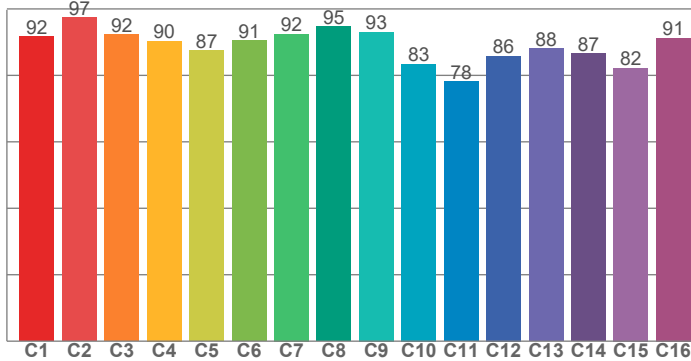
**Beam Intensities from 1-20m**

M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
<b>FT</b>	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
<b>LX</b>	4739	1185	527	296	190	132	97	74	59	47	39	33	28	24	21	19	16	15	13	12
<b>FC</b>	440.3	110.1	48.9	27.5	17.6	12.2	9	6.9	5.4	4.4	3.6	3.1	2.6	2.2	2	1.7	1.5	1.4	1.2	1.1

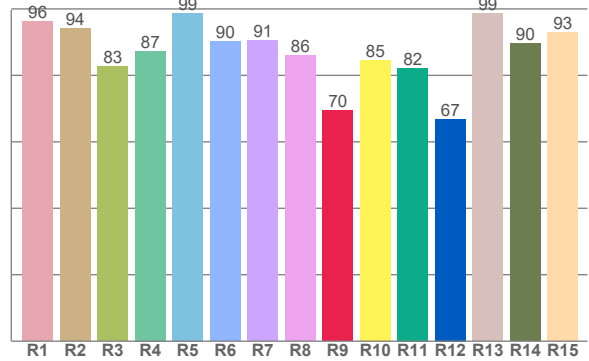
### Color Details



#### TM30: 89.1



#### CRI: 90.7 (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
96.3	94.1	82.7	87.4	98.8	90.3	90.6	86.0	69.5	84.6	82.2	66.9	98.7	89.7	92.9

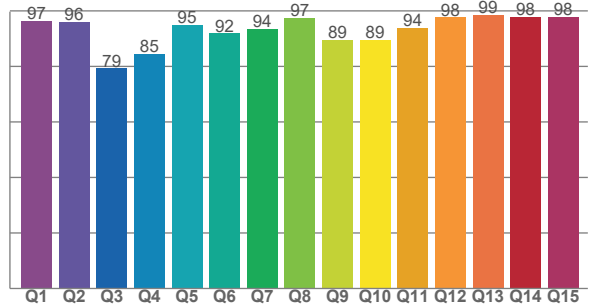
#### TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
91.8	97.4	92.2	90.3	87.5	90.6	92.4	94.7	93.1	83.4	78.1	85.9	88.1	86.6	82.2	91.3

#### CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
96.5	95.9	79.3	84.6	94.9	91.9	93.5	97.4	89.5	89.4	93.9	97.6	98.6	97.7	97.9

#### CQS: 91.4



#### 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
6252 K	90.7	69.5	89.1	106.1	91.4	0.318	0.326	0.203	0.312	-0.0042

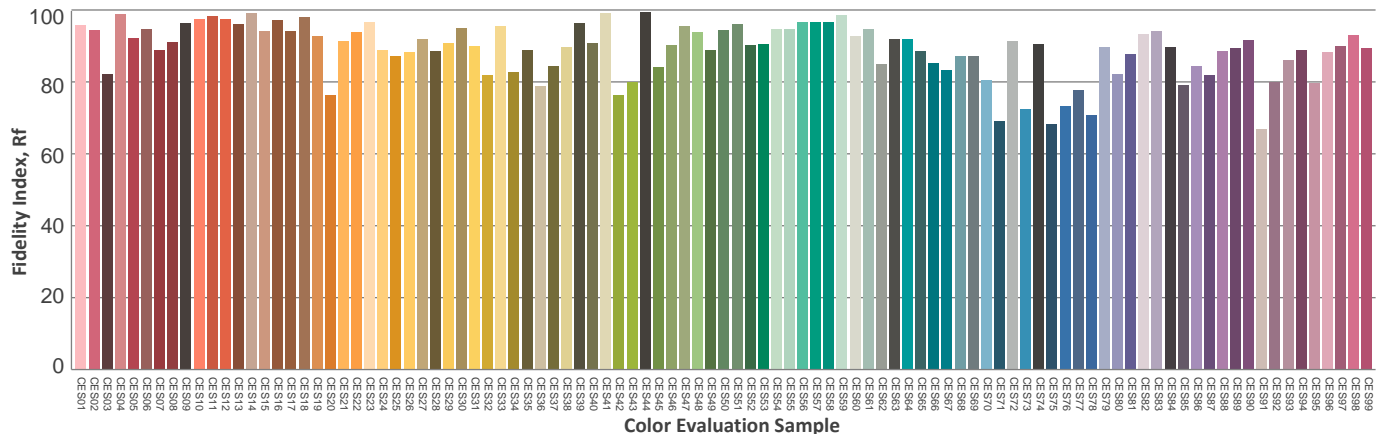
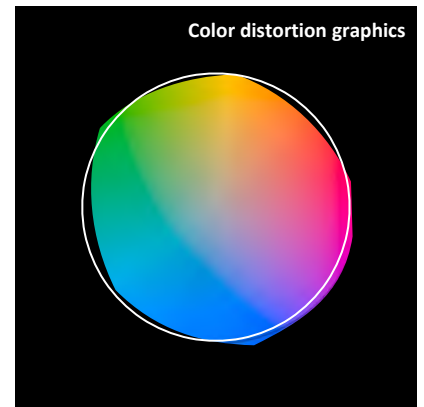
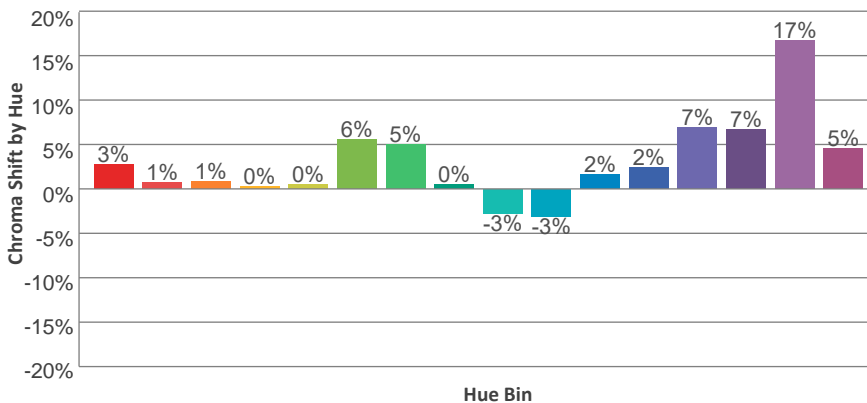
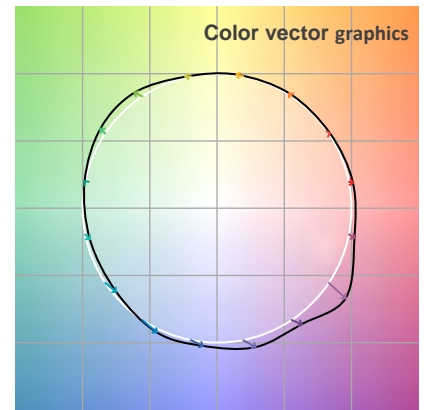
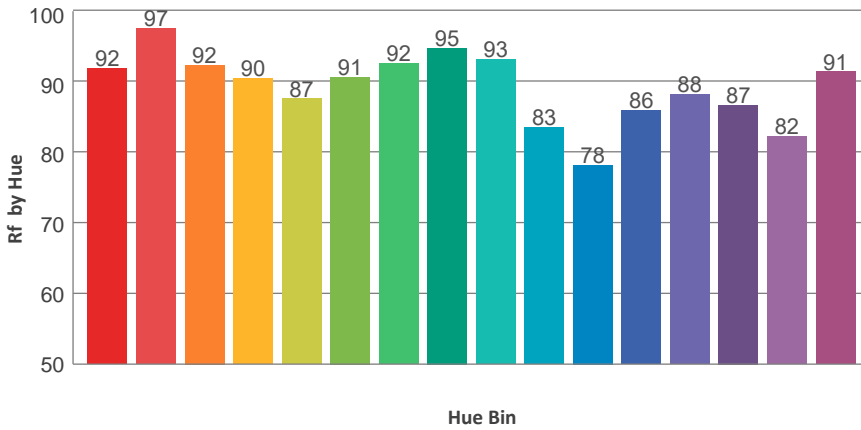
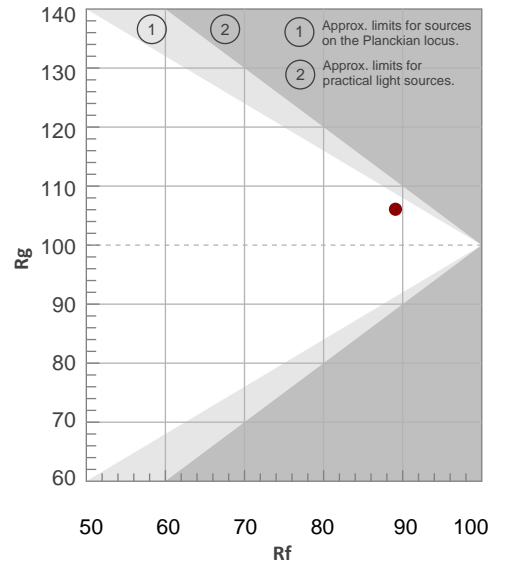


### TM30 Details

**Rf 89.1**  
Fidelity Index Rf

**Rg 106.1**  
Gamut Index Rg

Hue Bin	R <sub>f</sub>	Graphic shifts (%)	
		Chroma	Hue
1	92	3%	-1%
2	97	1%	0%
3	92	1%	3%
4	90	0%	5%
5	87	0%	4%
6	91	6%	3%
7	92	5%	-1%
8	95	0%	0%
9	93	-3%	4%
10	83	-3%	10%
11	78	2%	14%
12	86	2%	10%
13	88	7%	8%
14	87	7%	4%
15	82	17%	-3%
16	91	5%	-2%



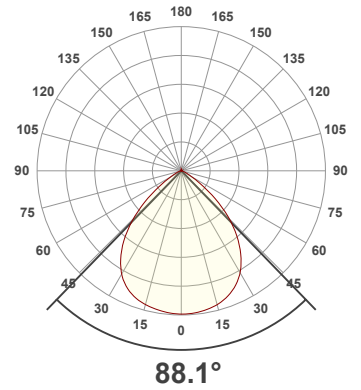
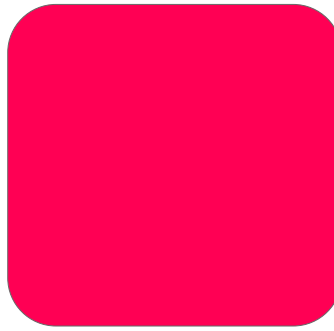
**Total Lumen Output: 1272 lm**

**Voltage: 113 V, Current: 0.773 A**

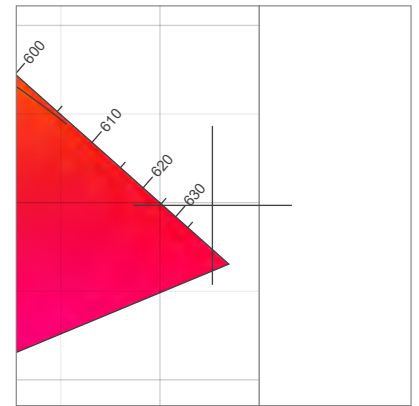
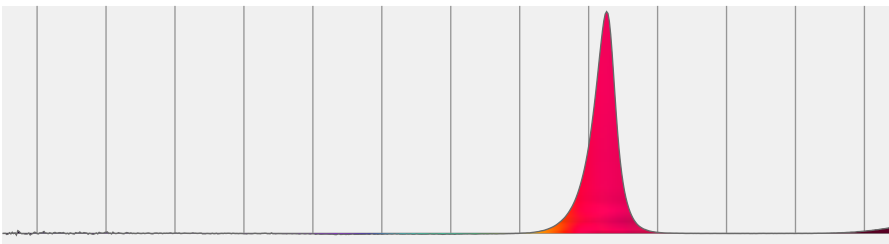
**Power: 84.2 W**

**Efficacy: 15 Lumen/Watt**

**Measurement Date: 6/29/2021**

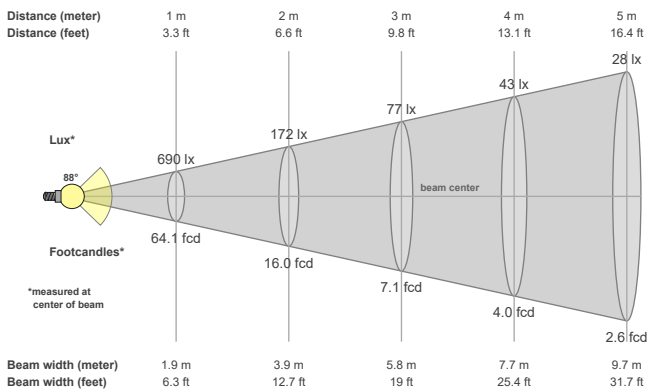


**Spectral distribution**



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
624	0.726	0.298	0.567	0.349

**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
88.1°	118.5°	140.5°

**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
690 cd	95.4%	77.5%

**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	690	172	77	43	28	19	14	11	9	7	6	5	4	4	3	3	2	2	2	2
FC	64.1	16	7.1	4	2.6	1.8	1.3	1	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2

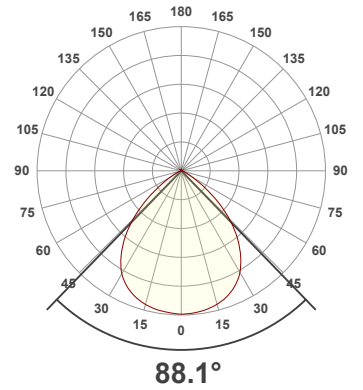
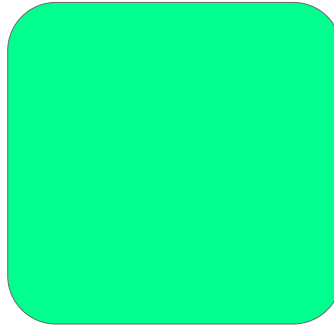
**Total Lumen Output: 1994 lm**

**Voltage: 113 V, Current: 0.591 A**

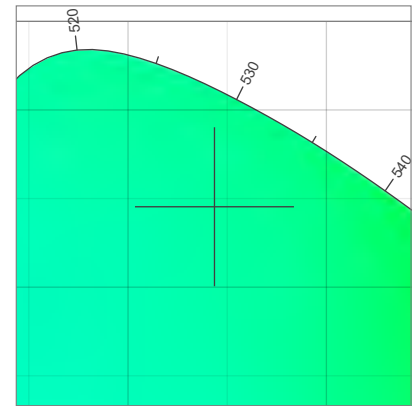
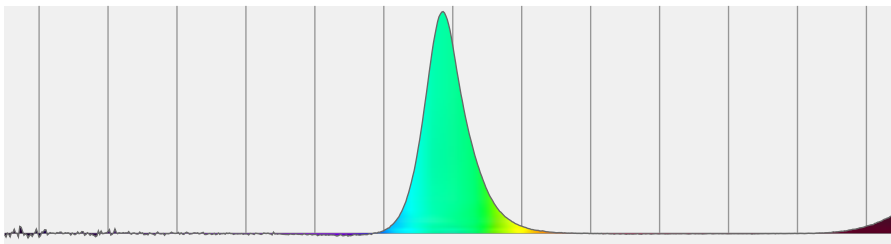
**Power: 62.8 W**

**Efficacy: 32 Lumen/Watt**

**Measurement Date: 6/29/2021**

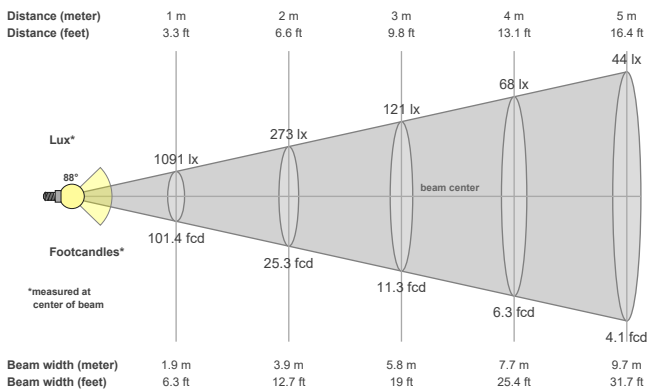


**Spectral distribution**



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
525	0.144	0.745	0.049	0.384

**Beam details**



**Beam angles**

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
88.1°	118.9°	139.7°

**Beam intensities**

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
1091 cd	96.3%	78.0%

**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	1091	273	121	68	44	30	22	17	13	11	9	8	6	6	5	4	4	3	3	3
FC	101.4	25.3	11.3	6.3	4.1	2.8	2.1	1.6	1.3	1	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3



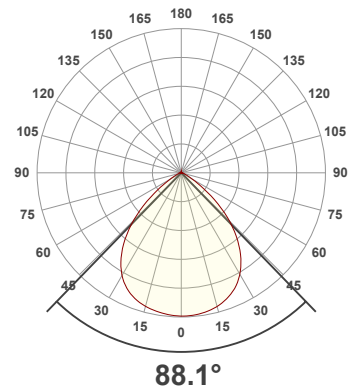
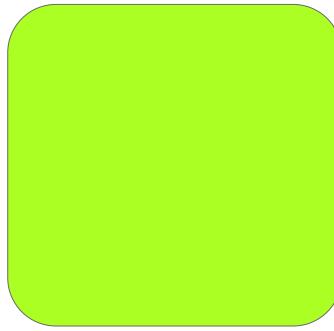
**Total Lumen Output: 9776 lm**

**Voltage: 111 V, Current: 1.79 A**

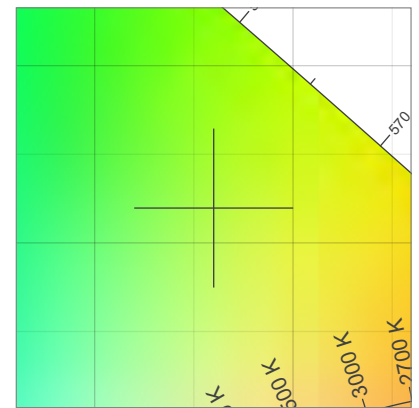
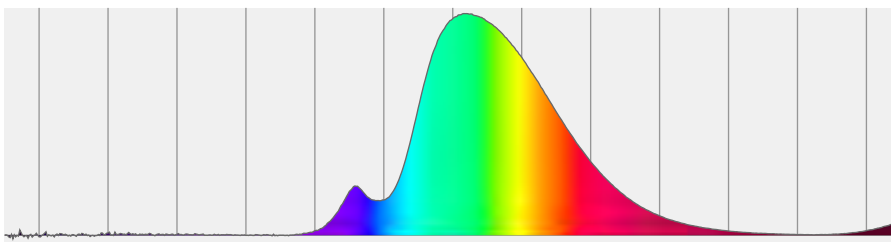
**Power: 195.8 W**

**Efficacy: 50 Lumen/Watt**

**Measurement Date: 6/29/2021**

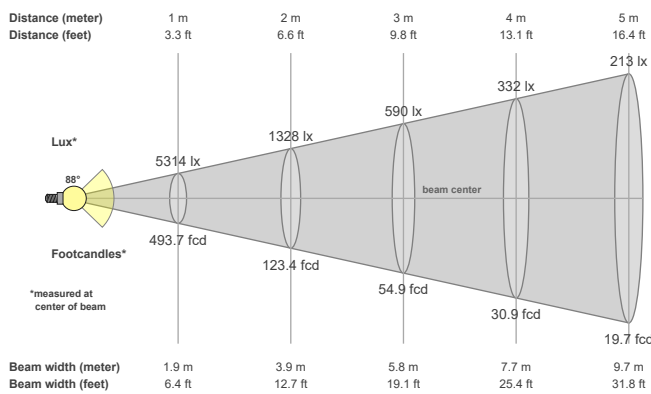


### Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
561	0.360	0.520	0.169	0.366

### Beam details



### Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>88.1°</b>	<b>119°</b>	<b>141.4°</b>

### Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>5318 cd</b>	<b>95.7%</b>	<b>77.6%</b>

### 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
<b>FT</b>	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
<b>LX</b>	5314	1328	590	332	213	148	108	83	66	53	44	37	31	27	24	21	18	16	15	13
<b>FC</b>	493.7	123.4	54.9	30.9	19.7	13.7	10.1	7.7	6.1	4.9	4.1	3.4	2.9	2.5	2.2	1.9	1.7	1.5	1.4	1.2

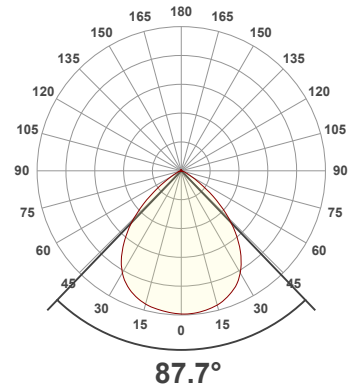
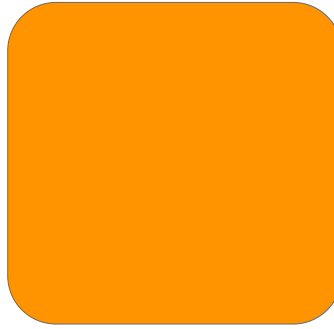
**Total Lumen Output: 2102 lm**

**Voltage: 113 V, Current: 0.875 A**

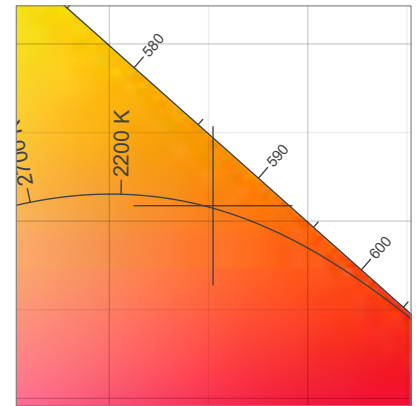
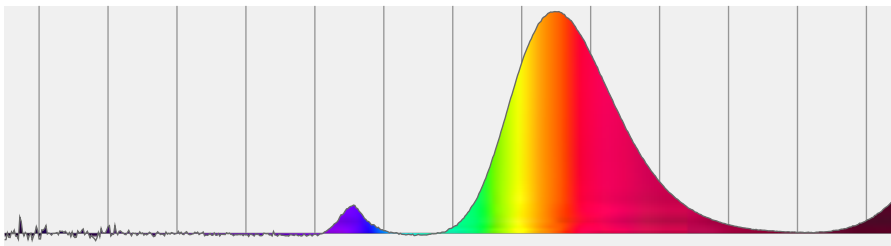
**Power: 95.7 W**

**Efficacy: 22 Lumen/Watt**

**Measurement Date: 6/29/2021**

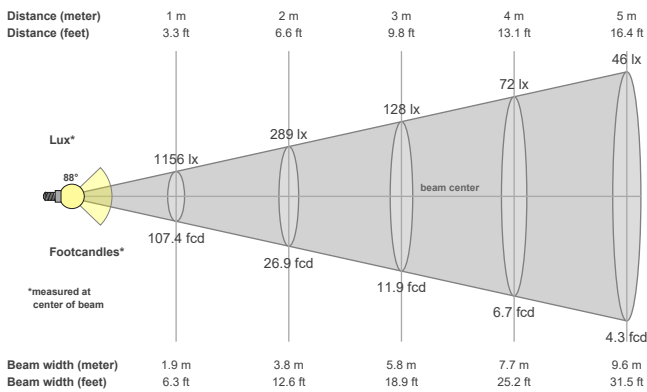


### Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
591	0.552	0.409	0.325	0.361

### Beam details



### Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
<b>87.7°</b>	<b>118.5°</b>	<b>138.8°</b>

### Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
<b>1158 cd</b>	<b>96.4%</b>	<b>78.4%</b>

### 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
<b>FT</b>	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
<b>LX</b>	1156	289	128	72	46	32	24	18	14	12	10	8	7	6	5	5	4	4	3	3
<b>FC</b>	107.4	26.9	11.9	6.7	4.3	3	2.2	1.7	1.3	1.1	0.9	0.7	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3