ELATION PROFESSIONAL

PALADIN™ PANEL

Photometric Test Report

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C O N T E N T S

TESTING PROCESS

Total Lumen Measurements

Lumens are measured using a Viso Systems Lab Spion and a 2π Integrating Sphere. As a goniophotometer, the Viso calculates the field lumens of the fixture by taking multiple measurements across the light beam. The measured lumens of the 2π Integrating Sphere tends to be higher than the Viso goniophotometer due to a variety of differences in measurement principles. Therefore, both values are provided in the report.

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.

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.

Fixtures are also analyzed using an 2π Integrating Sphere. This technique takes the output of the fixture and measures the amount of light inside a sealed perfect sphere. Due to the size of most fixtures they shine into an opening on the side of the sphere. A sensor is mounted behind a glare shield to avoid direct light input and a very short measurement is taken to gather the total lumens within the sphere. Due to different measurement principles, distortion and measurement uncertainties, there is a difference in these results.

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

Paladin Panel (Full On)

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Total Lumen Output*

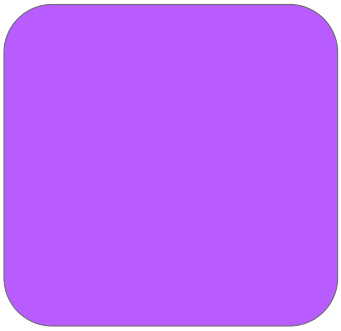
Integrating Sphere	**20033 lm**
VISO Lab Spion	**17020 lm**

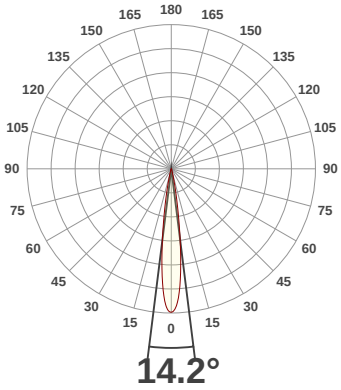
Voltage: 116 V, Current: 6.63 A

Power: 769 W

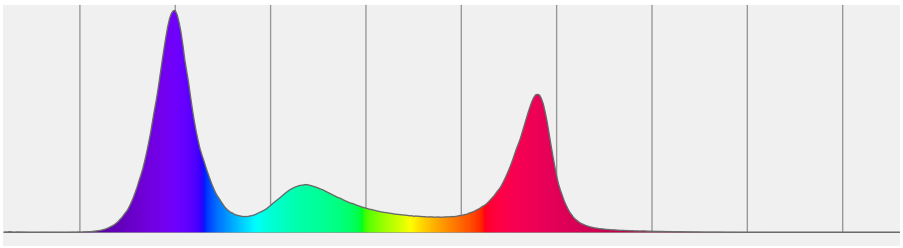
Efficacy: 22 Lumen/Watt

Measurement Date: 9/17/2019

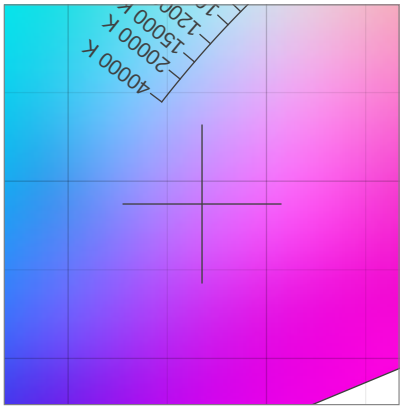




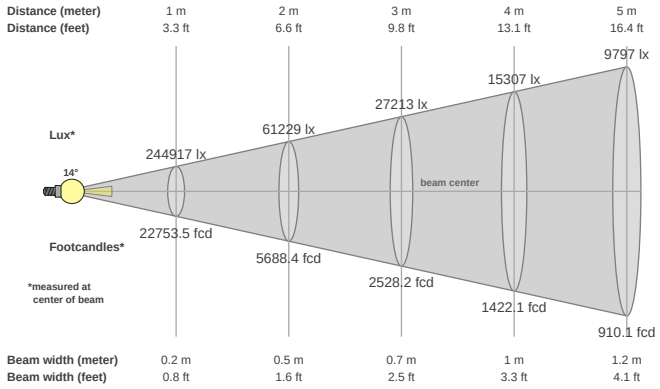
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
360	0.268	0.187	0.227	0.238



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
14.2°	24.8°	33.4°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
245239 cd	100.0%	99.9%

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	244917	61229	27213	15307	9797	6803	4998	3827	3024	2449	2024	1701	1449	1250	1089	957	847	756	678	612
FC	22753.5	5688.4	2528.2	1422.1	910.1	632	464.4	355.5	280.9	227.5	188	158	134.6	116.1	101.1	88.9	78.7	70.2	63	56.9

*Total Lumen measurements by calibrated Everfine 2π Integrating Sphere and Viso Systems Lab Spion

Paladin Panel (Full On + Frost)

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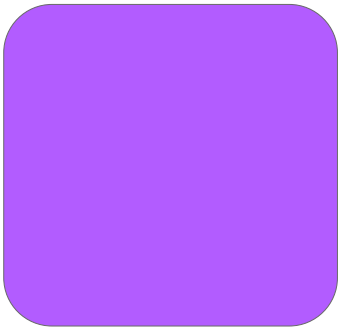
Total Lumen Output: 15663 lm

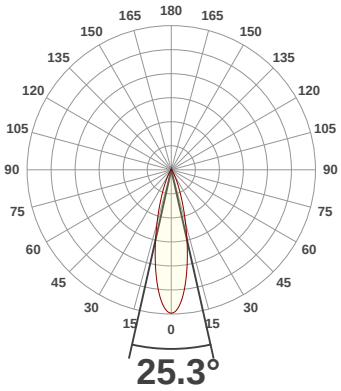
Voltage: 116 V, Current: 6.58 A

Power: 763 W

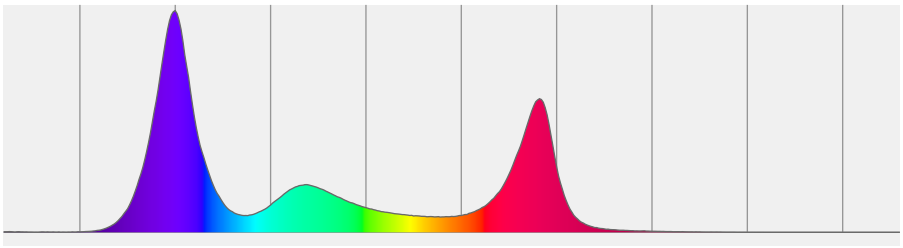
Efficacy: 21 Lumen/Watt

Measurement Date: 9/17/2019

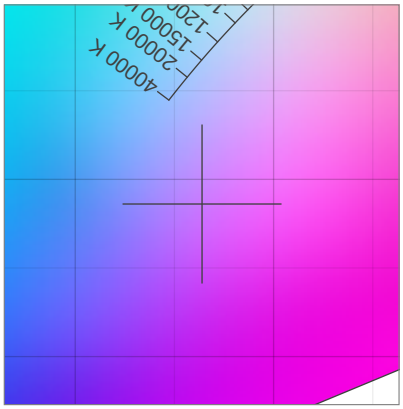




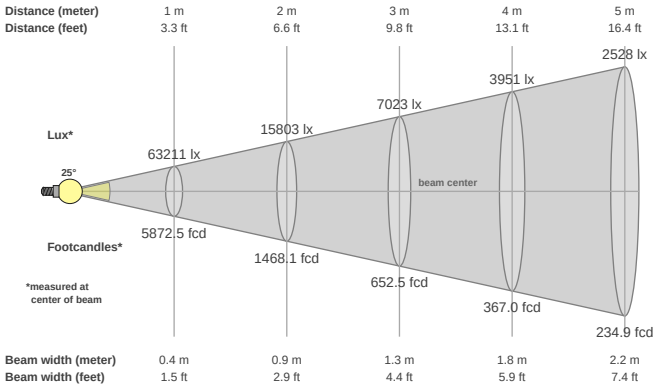
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
360	0.264	0.186	0.224	0.237



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.3°	49.5°	67.1°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
63261 cd	99.6%	98.9%

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	63211	15803	7023	3951	2528	1756	1290	988	780	632	522	439	374	323	281	247	219	195	175	158
FC	5872.5	1468.1	652.5	367	234.9	163.1	119.8	91.8	72.5	58.7	48.5	40.8	34.7	30	26.1	22.9	20.3	18.1	16.3	14.7

Paladin Panel (Red)

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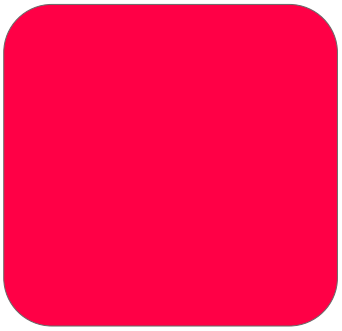
Total Lumen Output: 5278 lm

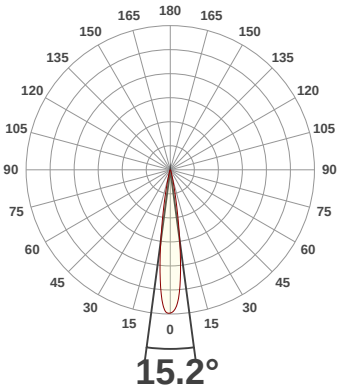
Voltage: 117 V, Current: 1.58 A

Power: 178.4 W

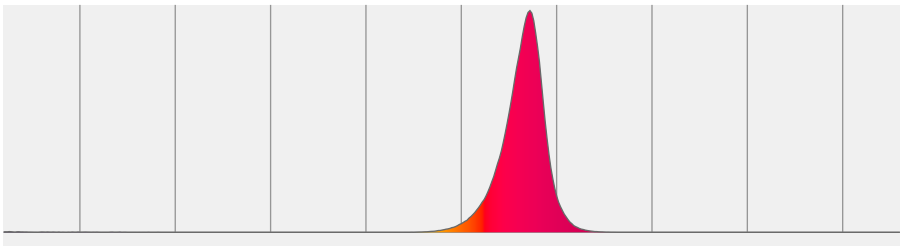
Efficacy: 30 Lumen/Watt

Measurement Date: 9/17/2019

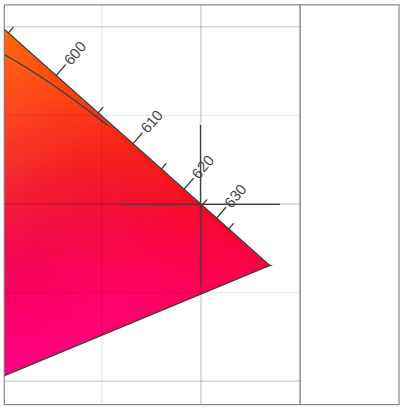




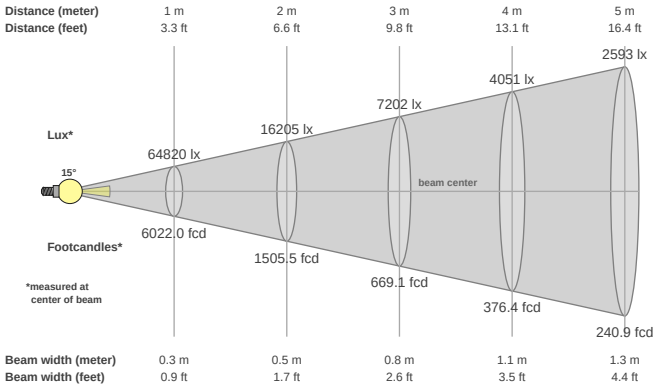
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
625	0.700	0.300	0.539	0.346



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
15.2°	26.1°	37.2°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
64868 cd	99.9%	99.9%

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	64820	16205	7202	4051	2593	1801	1323	1013	800	648	536	450	384	331	288	253	224	200	180	162
FC	6022	1505.5	669.1	376.4	240.9	167.3	122.9	94.1	74.3	60.2	49.8	41.8	35.6	30.7	26.8	23.5	20.8	18.6	16.7	15.1

Paladin Panel (Red + Frost)

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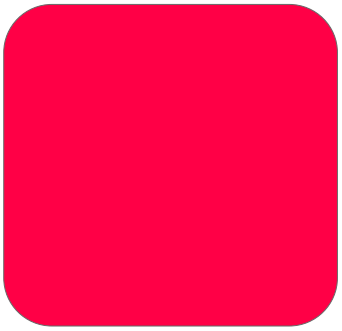
Total Lumen Output: 4931 lm

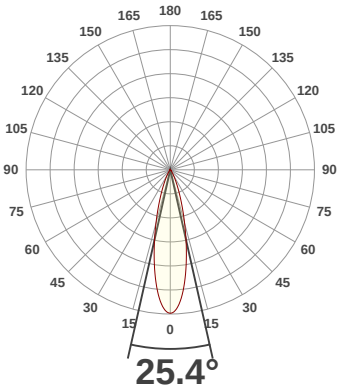
Voltage: 118 V, Current: 1.58 A

Power: 178.9 W

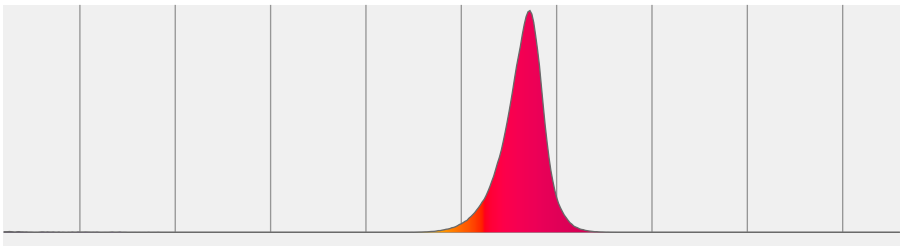
Efficacy: 28 Lumen/Watt

Measurement Date: 9/17/2019

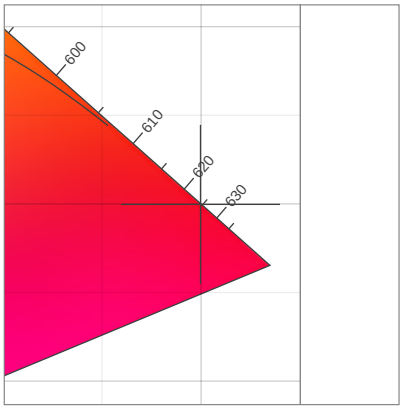




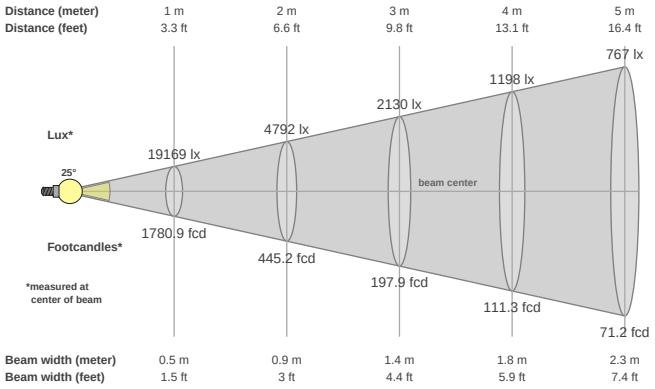
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
625	0.700	0.300	0.539	0.346



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.4°	49.8°	69.1°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
19181 cd	99.3%	97.3%

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	19169	4792	2130	1198	767	532	391	300	237	192	158	133	113	98	85	75	66	59	53	48
FC	1780.9	445.2	197.9	111.3	71.2	49.5	36.3	27.8	22	17.8	14.7	12.4	10.5	9.1	7.9	7	6.2	5.5	4.9	4.5

Paladin Panel (Green)

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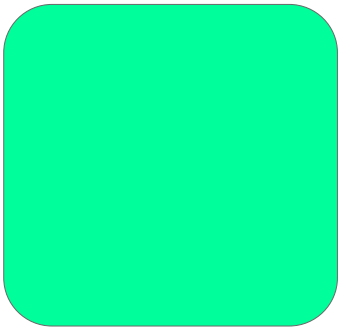
Total Lumen Output: 6212 lm

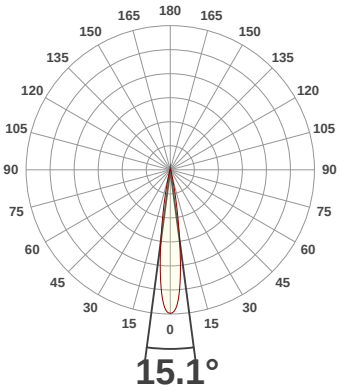
Voltage: 116 V, Current: 1.87 A

Power: 211.4 W

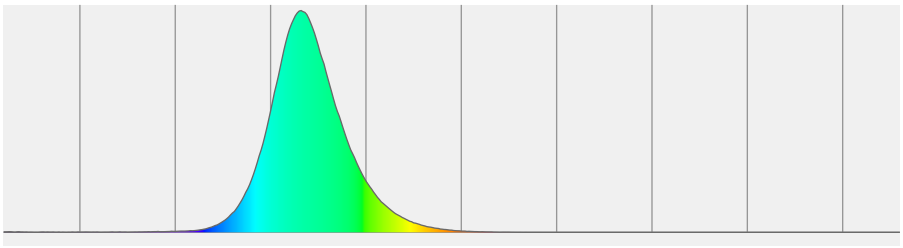
Efficacy: 29 Lumen/Watt

Measurement Date: 9/17/2019

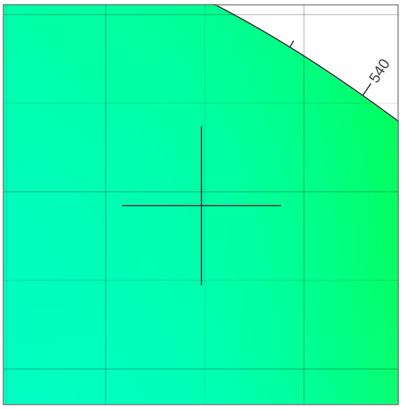




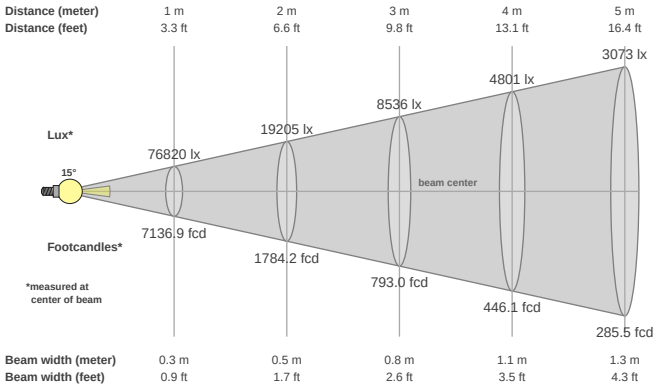
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
521	0.148	0.692	0.054	0.377



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
15.1°	26°	37.3°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
76822 cd	100.0%	100.0%

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	76820	19205	8536	4801	3073	2134	1568	1200	948	768	635	533	455	392	341	300	266	237	213	192
FC	7136.9	1784.2	793	446.1	285.5	198.2	145.7	111.5	88.1	71.4	59	49.6	42.2	36.4	31.7	27.9	24.7	22	19.8	17.8

Paladin Panel (Green + Frost)

Prepared For ELATION PROFESSIONAL

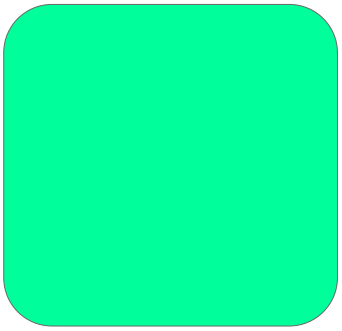
Total Lumen Output: 5756 lm

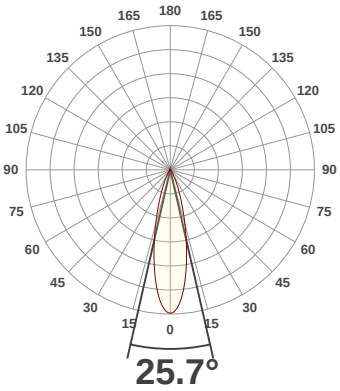
Voltage: 116 V, Current: 1.87 A

Power: 211.2 W

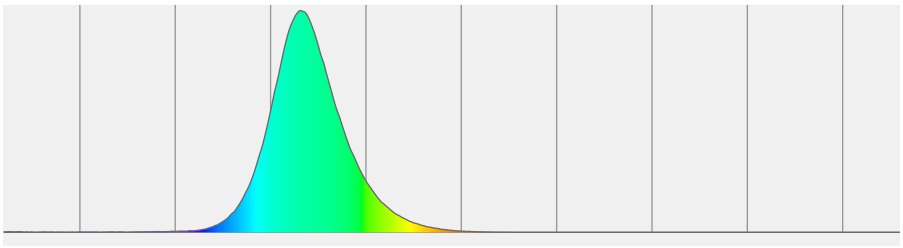
Efficacy: 27 Lumen/Watt

Measurement Date: 9/17/2019

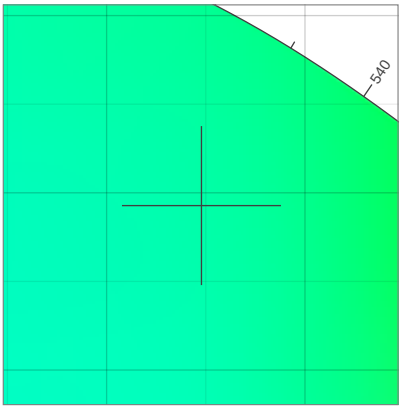




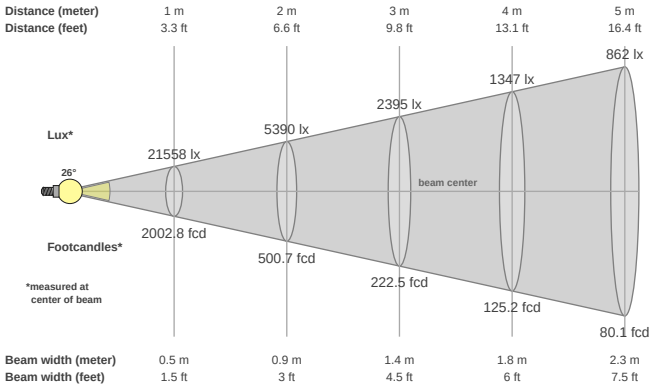
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
521	0.148	0.693	0.054	0.377



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.7°	50.6°	70.9°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
21572 cd	99.2%	96.7%

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	21558	5390	2395	1347	862	599	440	337	266	216	178	150	128	110	96	84	75	67	60	54
FC	2002.8	500.7	222.5	125.2	80.1	55.6	40.9	31.3	24.7	20	16.6	13.9	11.9	10.2	8.9	7.8	6.9	6.2	5.5	5

Paladin Panel (Blue)

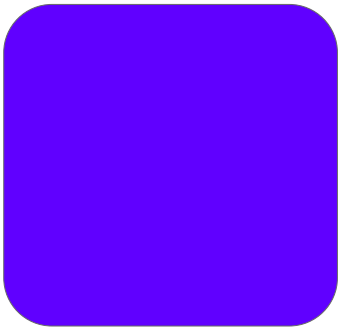
Total Lumen Output: 1507 lm

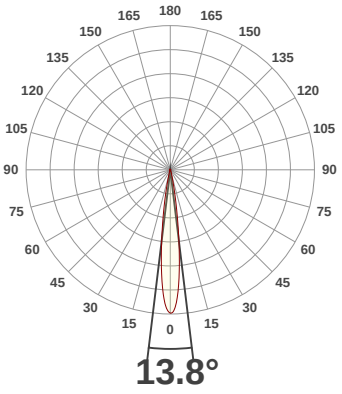
Voltage: 117 V, Current: 1.86 A

Power: 210.9 W

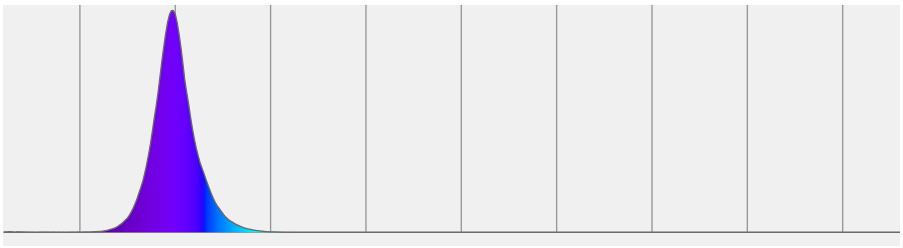
Efficacy: 7 Lumen/Watt

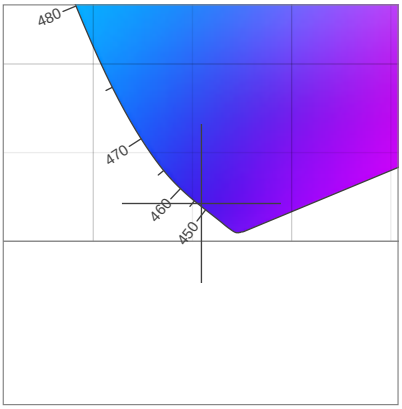
Measurement Date: 9/17/2019





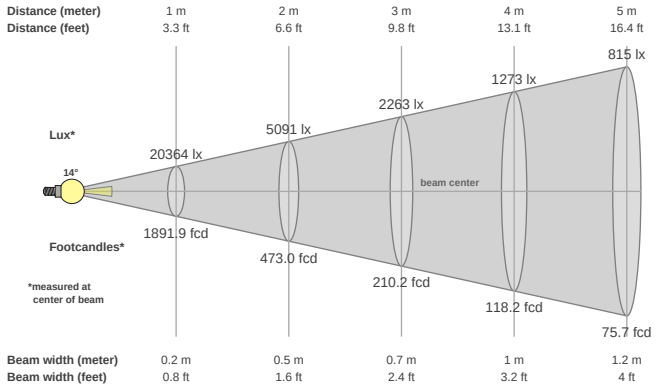
Spectral distribution





Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
453	0.155	0.021	0.210	0.043

Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
13.8°	24.8°	35.8°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
20411 cd	99.4%	98.6%

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	20364	5091	2263	1273	815	566	416	318	251	204	168	141	120	104	91	80	70	63	56	51
FC	1891.9	473	210.2	118.2	75.7	52.6	38.6	29.6	23.4	18.9	15.6	13.1	11.2	9.7	8.4	7.4	6.5	5.8	5.2	4.7

Paladin Panel (Blue + Frost)

Prepared For ELATION PROFESSIONAL

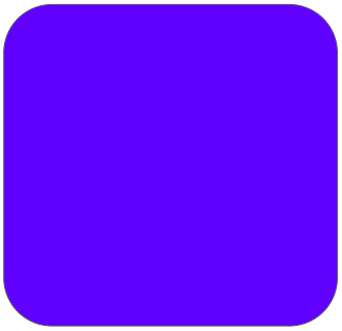
Total Lumen Output: 1406 lm

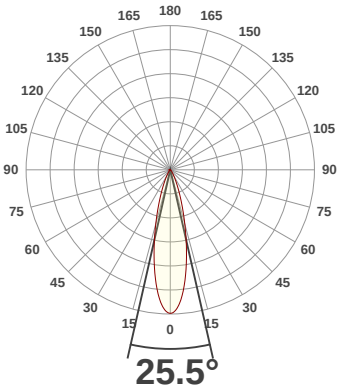
Voltage: 116 V, Current: 1.87 A

Power: 210.7 W

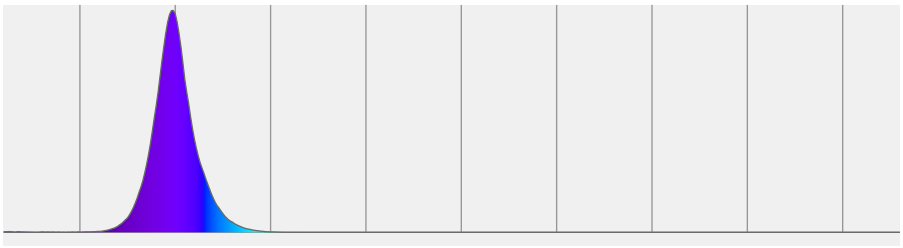
Efficacy: 7 Lumen/Watt

Measurement Date: 9/17/2019

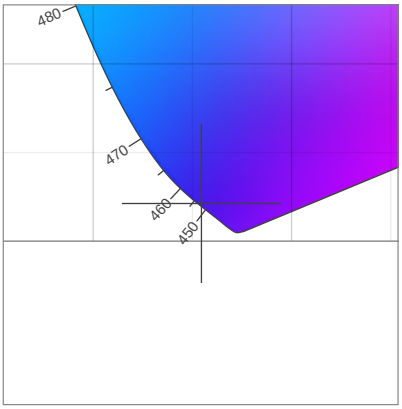




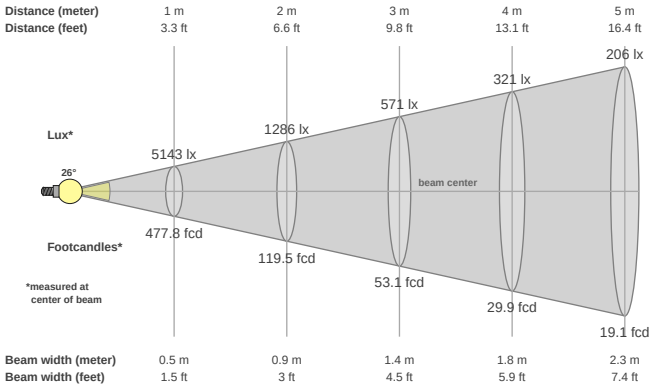
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
453	0.155	0.021	0.210	0.043



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.5°	50.4°	71.3°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
5148 cd	97.1%	94.1%

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	5143	1286	571	321	206	143	105	80	63	51	43	36	30	26	23	20	18	16	14	13
FC	477.8	119.5	53.1	29.9	19.1	13.3	9.8	7.5	5.9	4.8	3.9	3.3	2.8	2.4	2.1	1.9	1.7	1.5	1.3	1.2

Paladin Panel (White)

Prepared For ELATION PROFESSIONAL

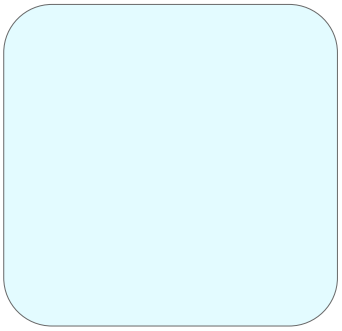
Total Lumen Output: 7739 lm

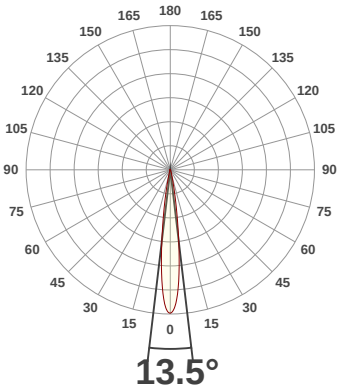
Voltage: 116 V, Current: 1.90 A

Power: 215.7 W

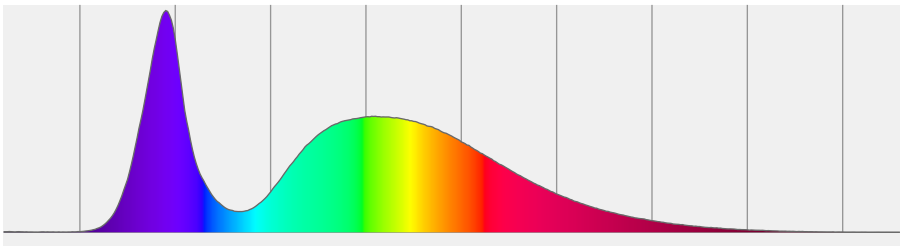
Efficacy: 36 Lumen/Watt

Measurement Date: 9/17/2019

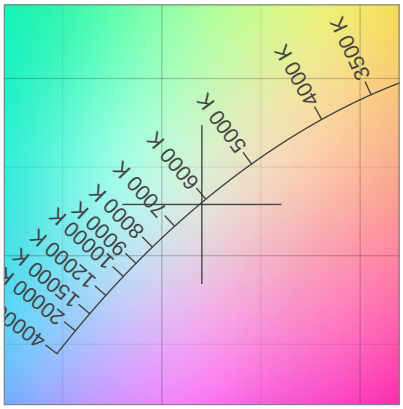




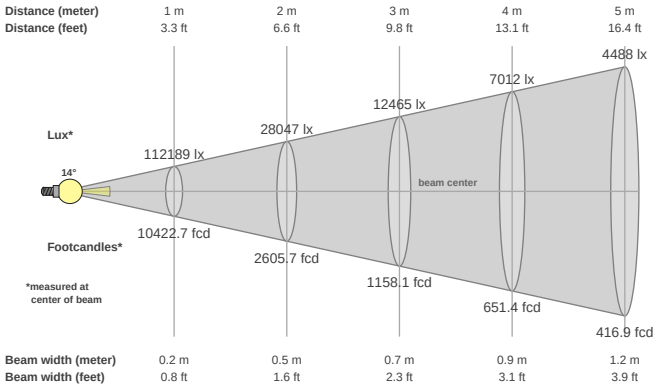
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
614	0.320	0.329	0.203	0.313



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
13.5°	24.3°	35.4°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
112206 cd	99.9%	99.9%

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	112189	28047	12465	7012	4488	3116	2290	1753	1385	1122	927	779	664	572	499	438	388	346	311	280
FC	10422.7	2605.7	1158.1	651.4	416.9	289.5	212.7	162.9	128.7	104.2	86.1	72.4	61.7	53.2	46.3	40.7	36.1	32.2	28.9	26.1

Paladin Panel (White + Frost)

Prepared For ELATION PROFESSIONAL

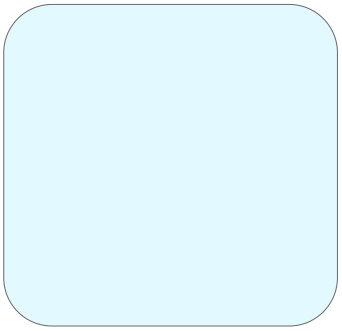
Total Lumen Output: 7304 lm

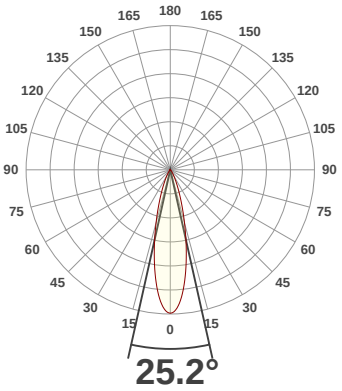
Voltage: 116 V, Current: 1.90 A

Power: 215.6 W

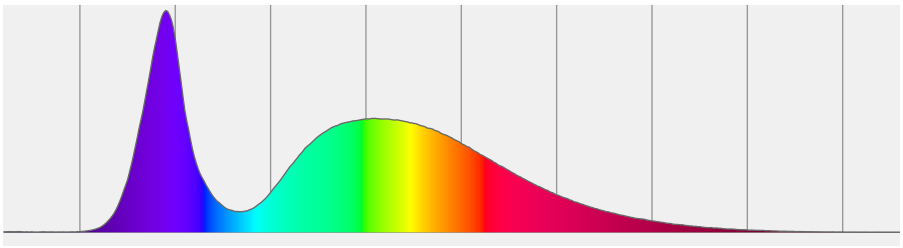
Efficacy: 34 Lumen/Watt

Measurement Date: 9/17/2019

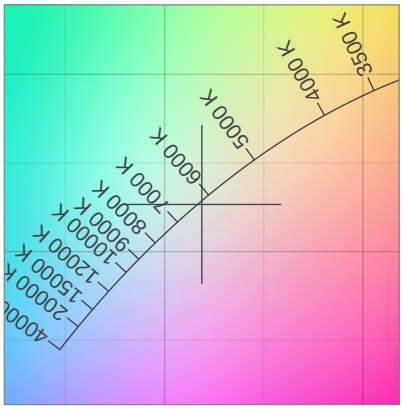




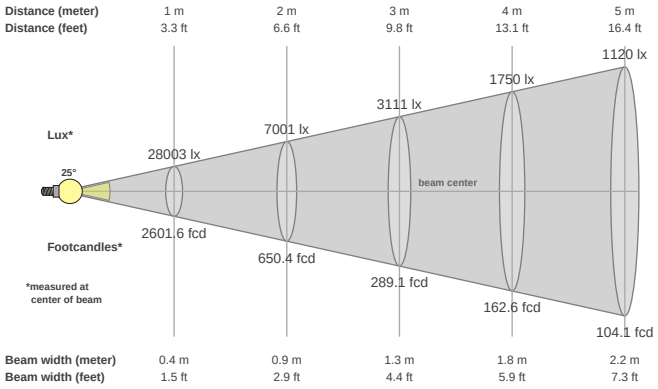
Spectral distribution



Dominant Wavelength	Color coordinate cie 1931	Color coordinate cie 1931	Color coordinate	Color coordinate
nm	x	y	u	v
829	0.319	0.327	0.203	0.312



Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
25.2°	50.1°	70.8°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
28018 cd	99.3%	96.9%

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	28003	7001	3111	1750	1120	778	571	438	346	280	231	194	166	143	124	109	97	86	78	70
FC	2601.6	650.4	289.1	162.6	104.1	72.3	53.1	40.6	32.1	26	21.5	18.1	15.4	13.3	11.6	10.2	9	8	7.2	6.5

Paladin Panel (CRI)

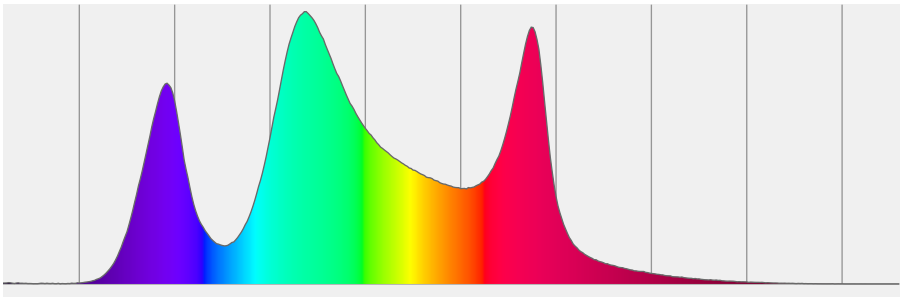
Prepared For ELATION PROFESSIONAL

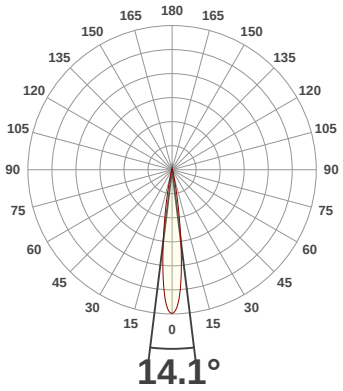
Total Lumen Output: 12677 lm
Color Temperature: 5766 K
CRI: 84.2
TLCI: 73
TM30: 87.2
CQS: 85.6
Measurement Date: 9/17/2019

Voltage: 116 V, Current: 3.33 A
Power: 386 W
Efficacy: 33 Lumen/Watt
High CRI Values:
R @ 23%
G @ 73%
W@ 100%

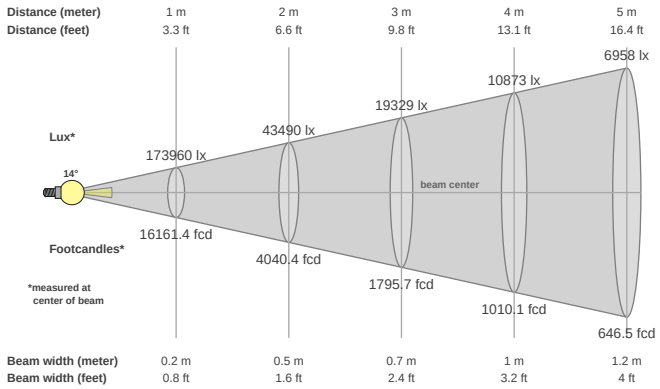
Spectral distribution

Dominant Wavelength 559





Beam details



Beam angles

Beam angle 50%	Field angle 10%	Cutoff angle 2,5%
14.1°	24.9°	36.1°

Beam intensities

Peak intensity	Int. ratio in 120° cone	Int. ratio in 90° cone
174100 cd	100.0%	99.9%

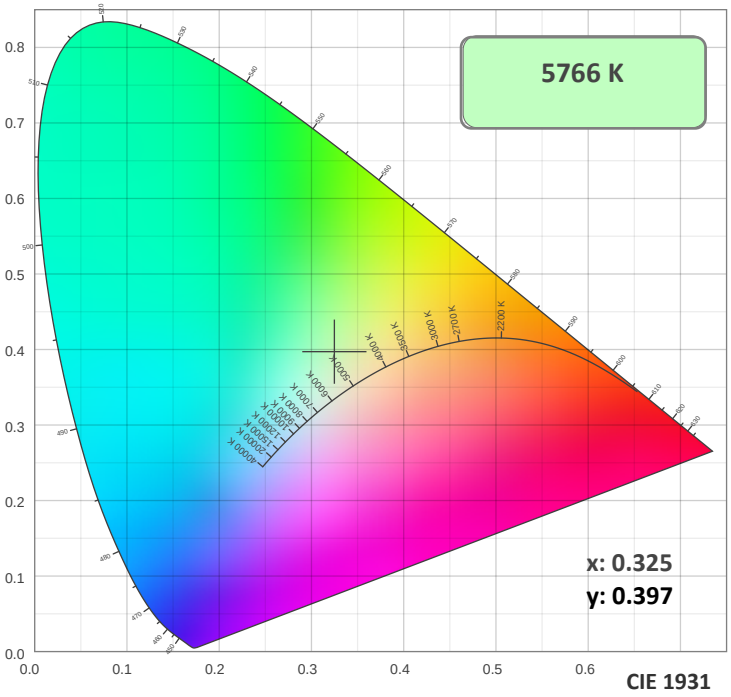
Beam Intensities from 1-20m

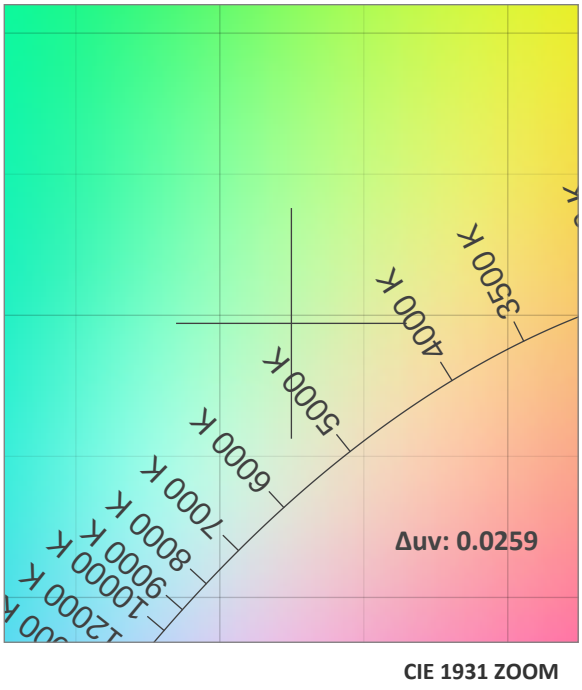
M	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
FT	3.3	6.6	9.8	13.1	16.4	19.7	23	26.2	29.5	32.8	36.1	39.4	42.7	45.9	49.2	52.5	55.8	59.1	62.3	65.6
LX	173960	43490	19329	10873	6958	4832	3550	2718	2148	1740	1438	1208	1029	888	773	680	602	537	482	435
FC	16161.4	4040.4	1795.7	1010.1	646.5	448.9	329.8	252.5	199.5	161.6	133.6	112.2	95.6	82.5	71.8	63.1	55.9	49.9	44.8	40.4

Paladin Panel (CRI)

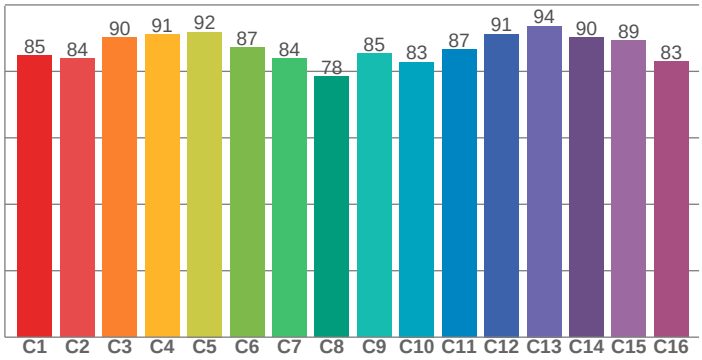
Prepared For ELATION PROFESSIONAL

Color Details

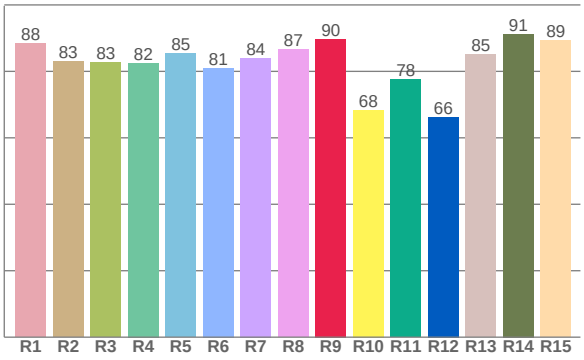




TM30: 87.2



CRI: 84.2 (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
88.4	82.9	82.7	82.5	85.5	81.0	84.0	86.6	89.7	68.3	77.5	66.3	85.1	91.3	89.3

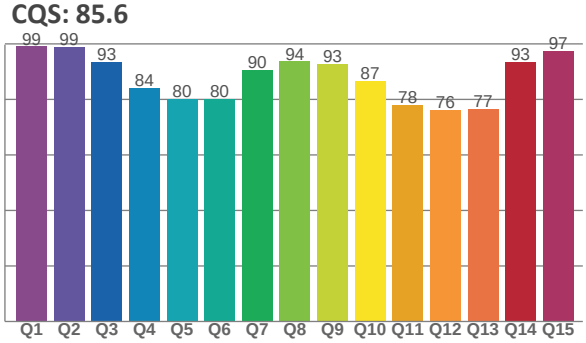
TM30 C Values, 16 binned values out of total of 99 C values

C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16
84.8	83.8	90.2	91.2	91.8	87.3	83.9	78.4	85.3	82.8	86.5	91.2	93.7	90.2	89.3	82.9

CQS Q Values

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	Q15
99.1	98.8	93.5	84.1	80.1	80.2	90.5	93.7	92.7	86.6	78.0	76.1	76.6	93.3	97.3

CQS: 85.6



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
5766 K	84.2	89.7	87.2	102.6	85.6	0.325	0.397	0.183	0.335	0.0259

Paladin Panel (CRI)

Prepared For ELATION PROFESSIONAL

TM30 Details

Rf 87.2

Fidelity Index Rf

Rg 102.6

Gamut Index Rg

		Graphic shifts (%)	
Hue Bin	R_f	Chroma	Hue
1	85	3%	-6%
2	84	0%	-7%
3	90	-1%	-2%
4	91	-1%	1%
5	92	1%	3%
6	87	7%	3%
7	84	7%	-4%
8	78	0%	-10%
9	85	-4%	-10%
10	83	-7%	-5%
11	87	-4%	5%
12	91	-2%	5%
13	94	2%	4%
14	90	5%	1%
15	89	9%	0%
16	83	6%	-6%