



PALADIN™
CUBE

Photometric Test Report

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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](#)

Total Lumen Output*

Integrating Sphere **3263 lm**

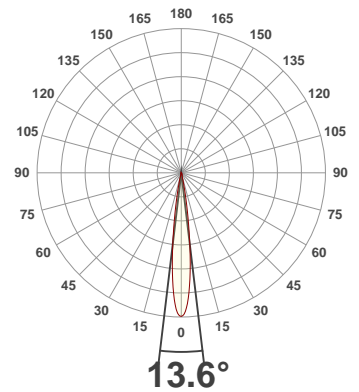
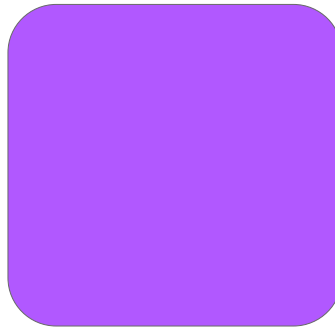
VISO Lab Spion **2194 lm**

Voltage: 119 V, Current: 1.01 A

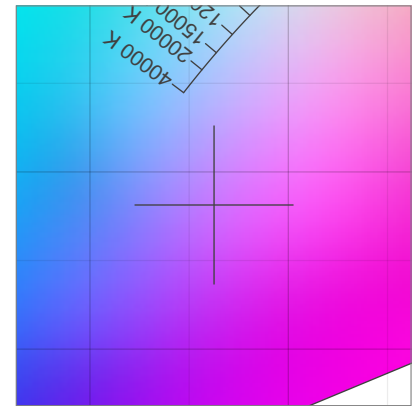
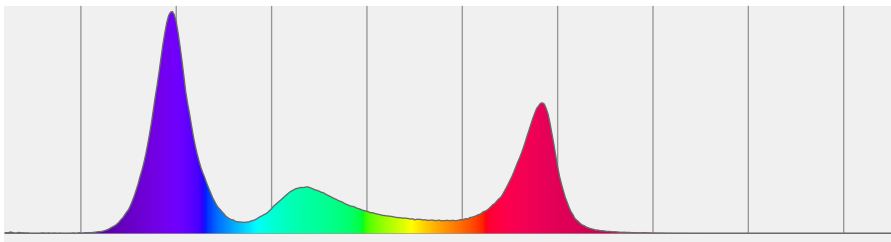
Power: 119.4 W

Efficacy: 18 Lumen/Watt

Measurement Date: 9/13/2019

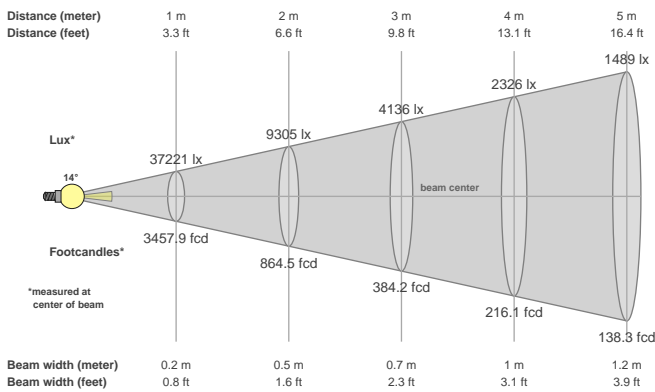


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 360 | 0.263 | 0.181 | 0.226 | 0.234 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 13.6° | 23.2° | 28.2° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 37251 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 | 37221 | 9305 | 4136 | 2326 | 1489 | 1034 | 760 | 582 | 460 | 372 | 308 | 258 | 220 | 190 | 165 | 145 | 129 | 115 | 103 | 93 |
| FC | 3457.9 | 864.5 | 384.2 | 216.1 | 138.3 | 96.1 | 70.6 | 54 | 42.7 | 34.6 | 28.6 | 24 | 20.5 | 17.6 | 15.4 | 13.5 | 12 | 10.7 | 9.6 | 8.6 |

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

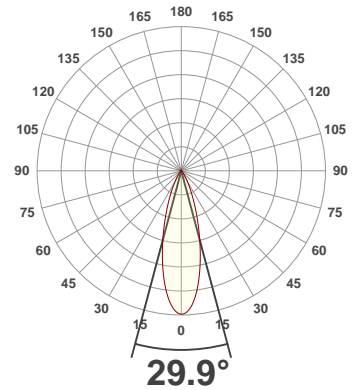
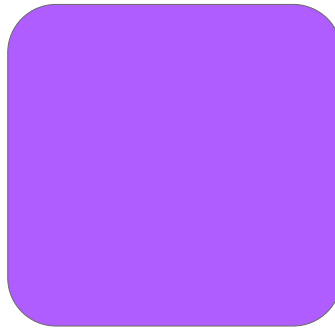
Total Lumen Output: 2377 lm

Voltage: 117 V, Current: 1.00 A

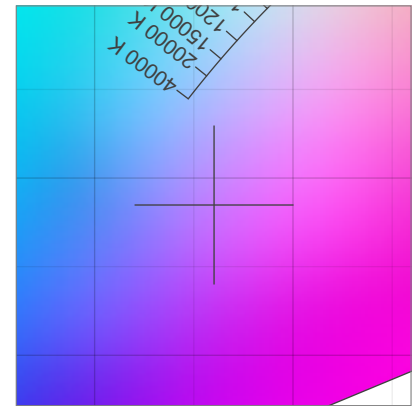
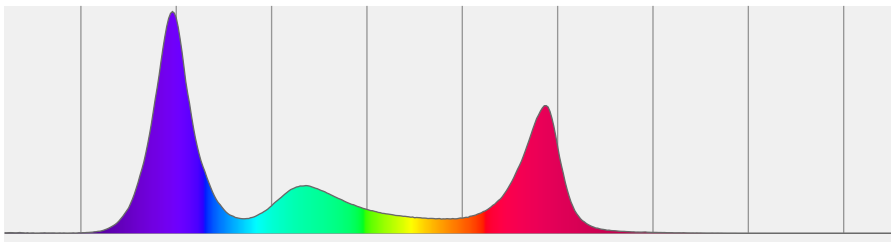
Power: 117 W

Efficacy: 20 Lumen/Watt

Measurement Date: 9/13/2019

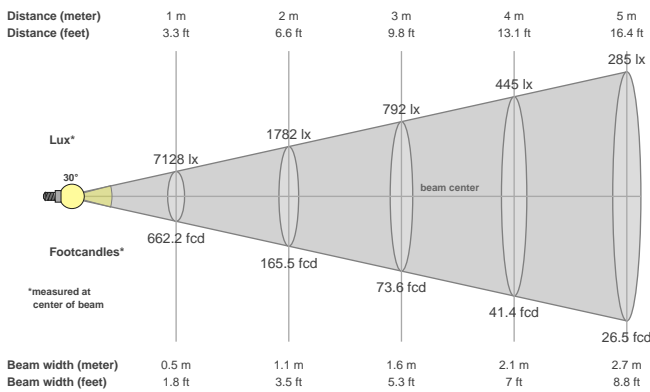


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 360 | 0.260 | 0.185 | 0.222 | 0.236 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 29.9° | 57.8° | 77.1° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 7131 cd | 99.7% | 98.5% |

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 | 7128 | 1782 | 792 | 445 | 285 | 198 | 145 | 111 | 88 | 71 | 59 | 49 | 42 | 36 | 32 | 28 | 25 | 22 | 20 | 18 |
| FC | 662.2 | 165.5 | 73.6 | 41.4 | 26.5 | 18.4 | 13.5 | 10.3 | 8.2 | 6.6 | 5.5 | 4.6 | 3.9 | 3.4 | 2.9 | 2.6 | 2.3 | 2 | 1.8 | 1.7 |

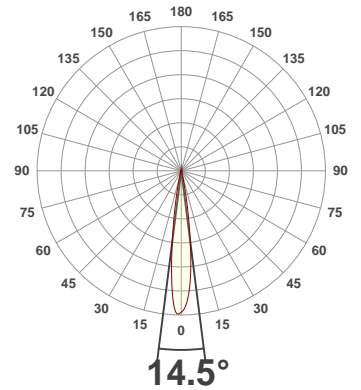
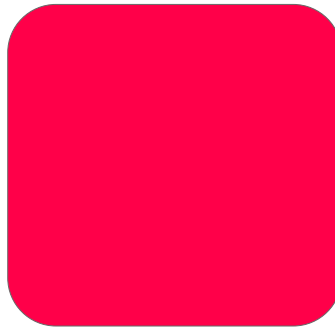
Total Lumen Output: 607 lm

Voltage: 121 V, Current: 0.256 A

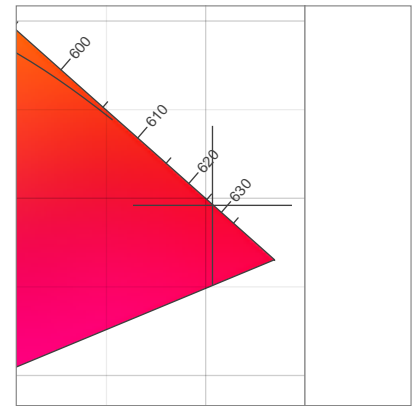
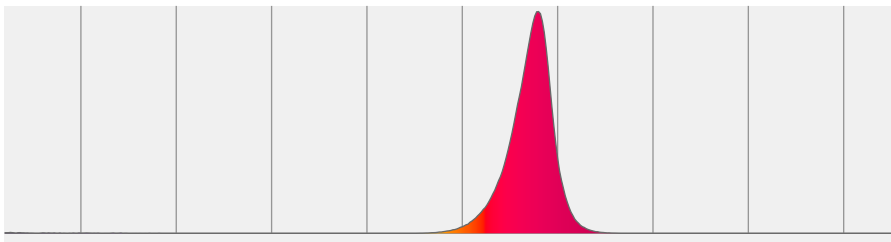
Power: 29.1 W

Efficacy: 21 Lumen/Watt

Measurement Date: 9/13/2019

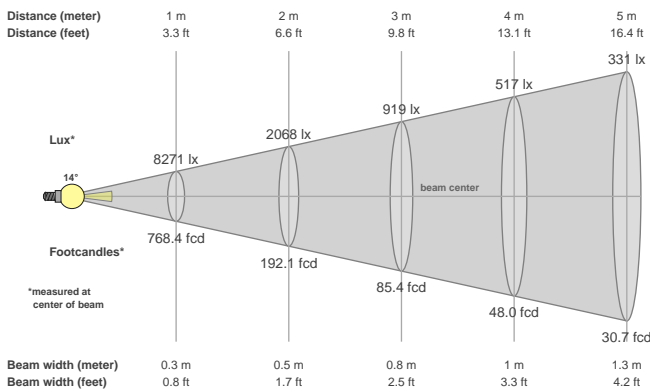


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 x | Color coordinate cie 1931 y | Color coordinate u | Color coordinate v |
|---------------------|-----------------------------|-----------------------------|--------------------|--------------------|
| nm | x | y | u | v |
| 627 | 0.703 | 0.296 | 0.547 | 0.345 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 14.5° | 24.9° | 34.2° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 8389 cd | 99.9% | 99.8% |

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 | 8271 | 2068 | 919 | 517 | 331 | 230 | 169 | 129 | 102 | 83 | 68 | 57 | 49 | 42 | 37 | 32 | 29 | 26 | 23 | 21 |
| FC | 768.4 | 192.1 | 85.4 | 48 | 30.7 | 21.3 | 15.7 | 12 | 9.5 | 7.7 | 6.4 | 5.3 | 4.5 | 3.9 | 3.4 | 3 | 2.7 | 2.4 | 2.1 | 1.9 |

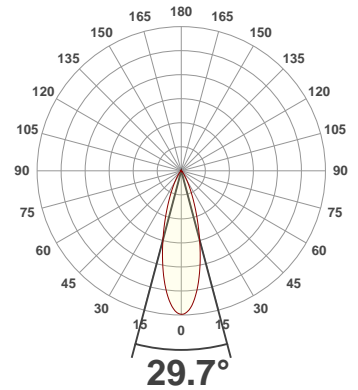
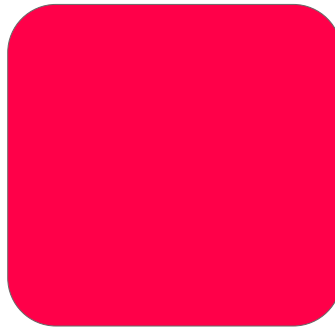
Total Lumen Output: 594 lm

Voltage: 119 V, Current: 0.258 A

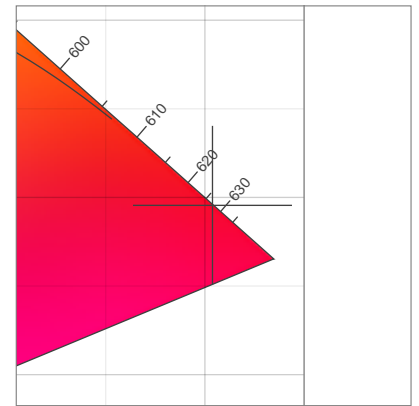
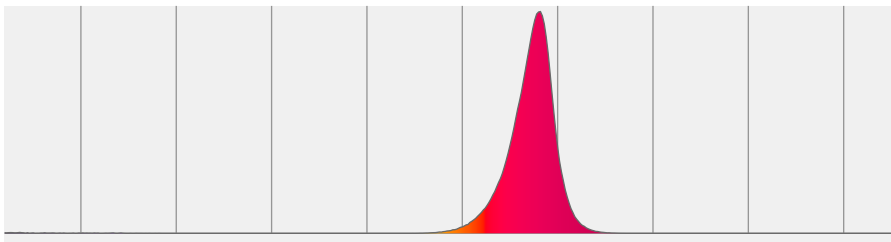
Power: 29.0 W

Efficacy: 20 Lumen/Watt

Measurement Date: 9/13/2019

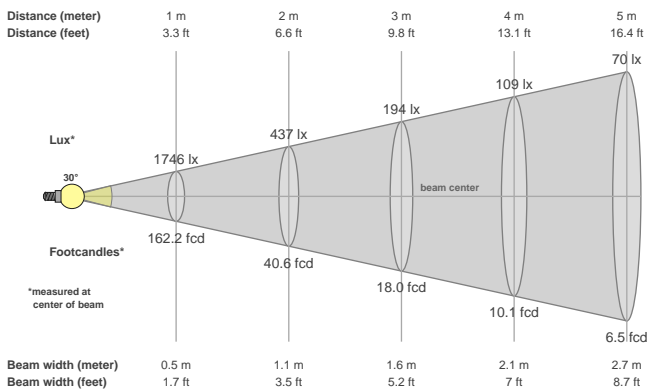


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 628 | 0.704 | 0.296 | 0.548 | 0.345 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 29.7° | 57.7° | 79° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 1747 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 | 1746 | 437 | 194 | 109 | 70 | 49 | 36 | 27 | 22 | 17 | 14 | 12 | 10 | 9 | 8 | 7 | 6 | 5 | 5 | 4 |
| FC | 162.2 | 40.6 | 18 | 10.1 | 6.5 | 4.5 | 3.3 | 2.5 | 2 | 1.6 | 1.3 | 1.1 | 1 | 0.8 | 0.7 | 0.6 | 0.6 | 0.5 | 0.4 | 0.4 |

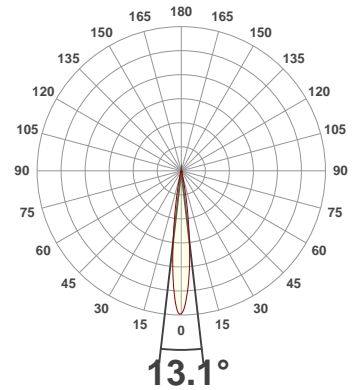
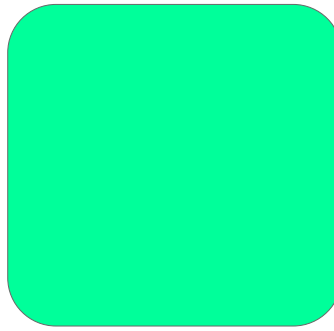
Total Lumen Output: 865 lm

Voltage: 120 V, Current: 0.285 A

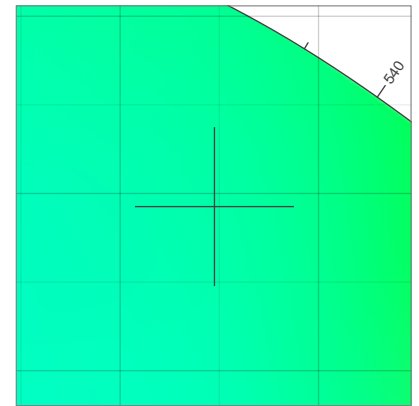
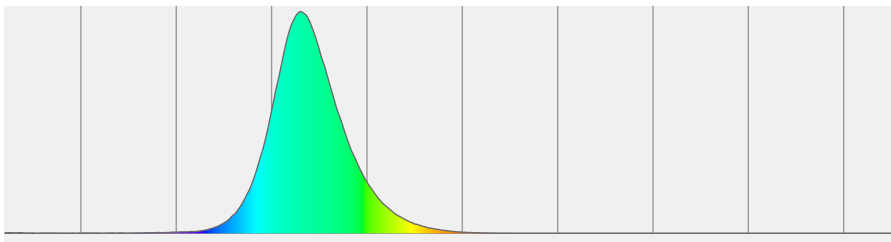
Power: 32.7 W

Efficacy: 26 Lumen/Watt

Measurement Date: 9/13/2019

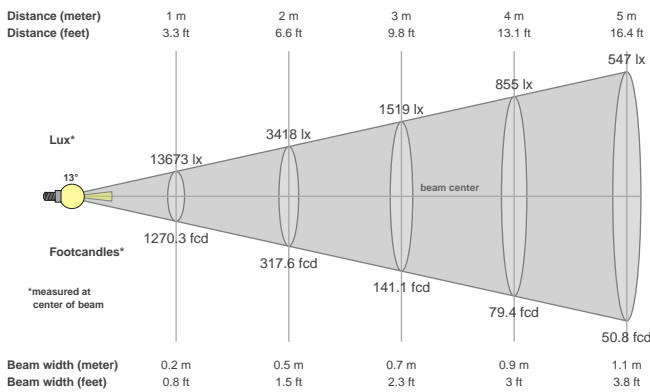


Spectral distribution



| 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% |
|----------------|-----------------|-------------------|
| 13.1° | 23.7° | 32.2° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 13760 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 | 13673 | 3418 | 1519 | 855 | 547 | 380 | 279 | 214 | 169 | 137 | 113 | 95 | 81 | 70 | 61 | 53 | 47 | 42 | 38 | 34 |
| FC | 1270.3 | 317.6 | 141.1 | 79.4 | 50.8 | 35.3 | 25.9 | 19.8 | 15.7 | 12.7 | 10.5 | 8.8 | 7.5 | 6.5 | 5.6 | 5 | 4.4 | 3.9 | 3.5 | 3.2 |

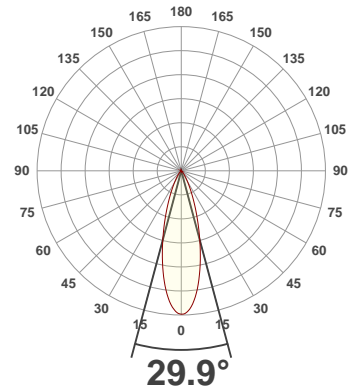
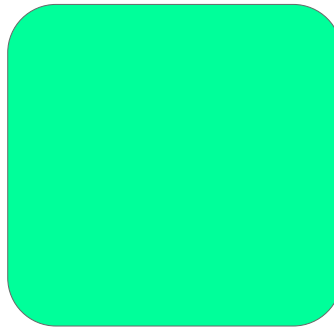
Total Lumen Output: 875 lm

Voltage: 119 V, Current: 0.286 A

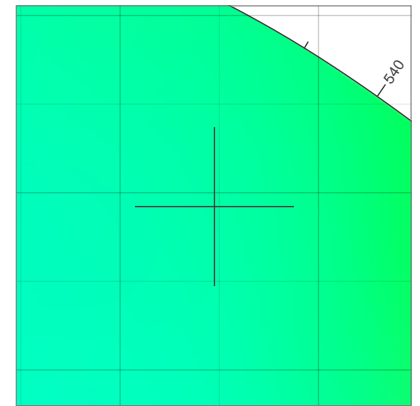
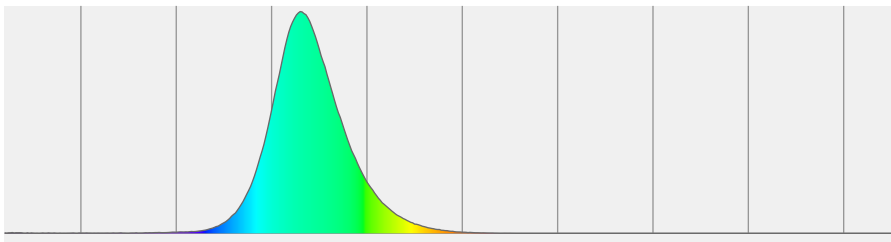
Power: 32.5 W

Efficacy: 27 Lumen/Watt

Measurement Date: 9/13/2019

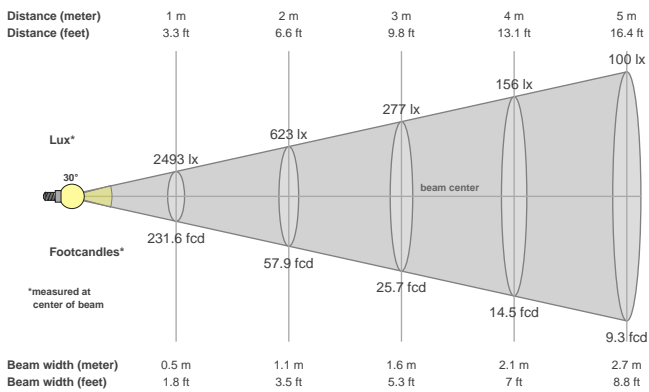


Spectral distribution



| 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% |
|----------------|-----------------|-------------------|
| 29.9° | 58.5° | 81.2° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 2494 cd | 99.1% | 96.1% |

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 | 2493 | 623 | 277 | 156 | 100 | 69 | 51 | 39 | 31 | 25 | 21 | 17 | 15 | 13 | 11 | 10 | 9 | 8 | 7 | 6 |
| FC | 231.6 | 57.9 | 25.7 | 14.5 | 9.3 | 6.4 | 4.7 | 3.6 | 2.9 | 2.3 | 1.9 | 1.6 | 1.4 | 1.2 | 1 | 0.9 | 0.8 | 0.7 | 0.6 | 0.6 |

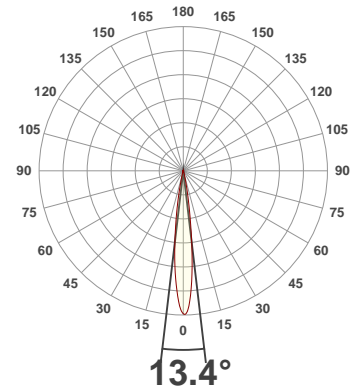
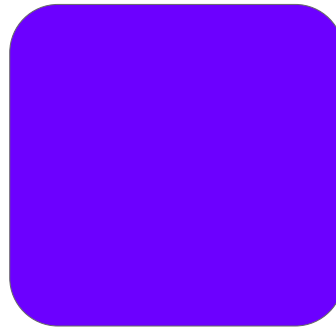
Total Lumen Output: 181 lm

Voltage: 120 V, Current: 0.289 A

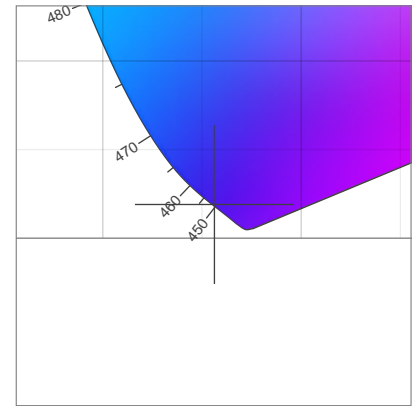
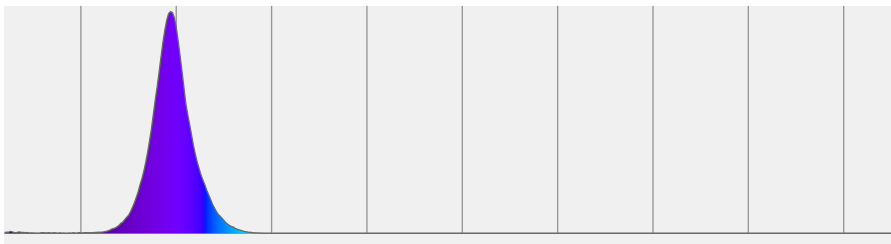
Power: 33.2 W

Efficacy: 5 Lumen/Watt

Measurement Date: 9/13/2019

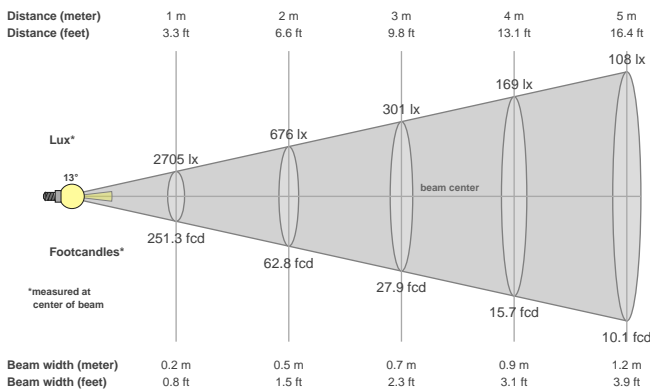


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 451 | 0.156 | 0.019 | 0.214 | 0.039 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 13.4° | 24° | 32.2° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 2716 cd | 99.1% | 98.8% |

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 | 2705 | 676 | 301 | 169 | 108 | 75 | 55 | 42 | 33 | 27 | 22 | 19 | 16 | 14 | 12 | 11 | 9 | 8 | 7 | 7 |
| FC | 251.3 | 62.8 | 27.9 | 15.7 | 10.1 | 7 | 5.1 | 3.9 | 3.1 | 2.5 | 2.1 | 1.7 | 1.5 | 1.3 | 1.1 | 1 | 0.9 | 0.8 | 0.7 | 0.6 |

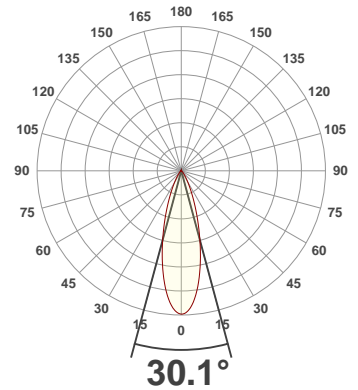
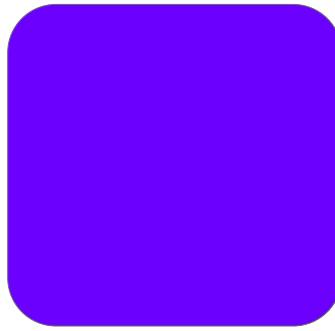
Total Lumen Output: 194 lm

Voltage: 118 V, Current: 0.291 A

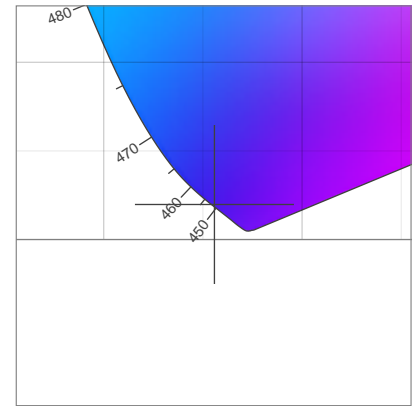
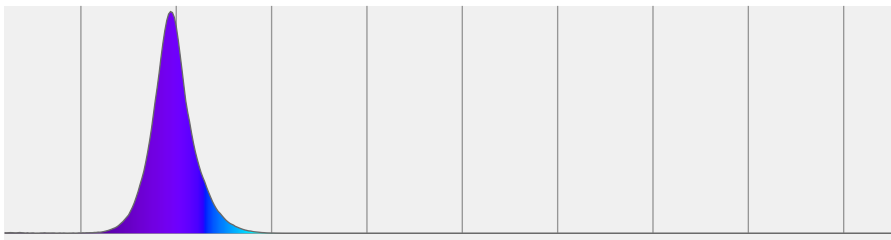
Power: 33.1 W

Efficacy: 6 Lumen/Watt

Measurement Date: 9/13/2019

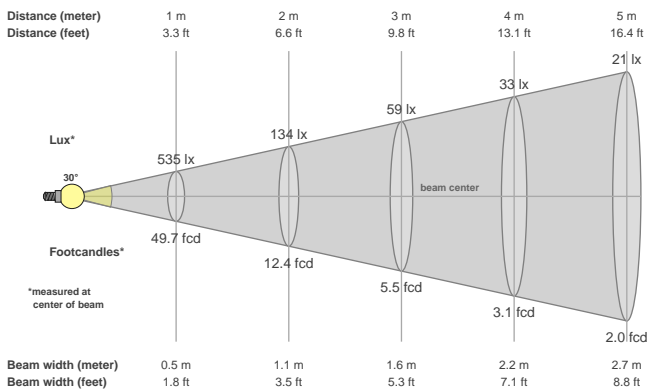


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 451 | 0.156 | 0.020 | 0.213 | 0.041 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 30.1° | 58.9° | 82.3° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 535 cd | 97.6% | 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 | 535 | 134 | 59 | 33 | 21 | 15 | 11 | 8 | 7 | 5 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 |
| FC | 49.7 | 12.4 | 5.5 | 3.1 | 2 | 1.4 | 1 | 0.8 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 |

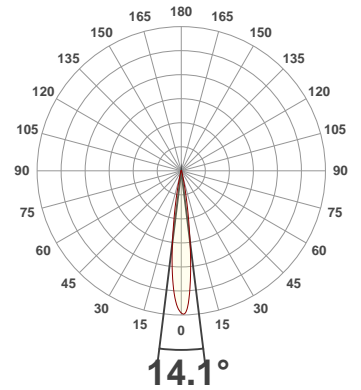
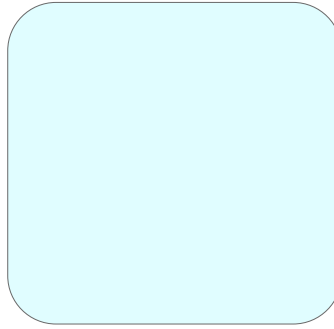
Total Lumen Output: 1057 lm

Voltage: 119 V, Current: 0.291 A

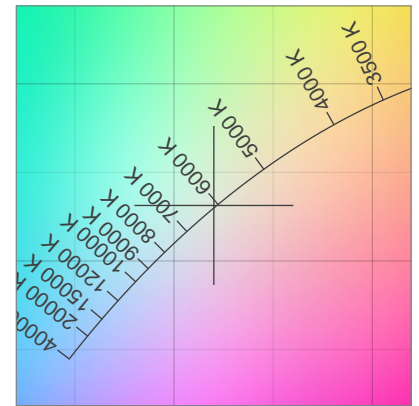
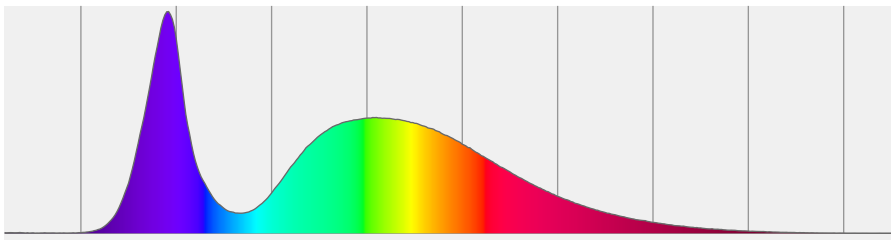
Power: 33.3 W

Efficacy: 32 Lumen/Watt

Measurement Date: 9/13/2019

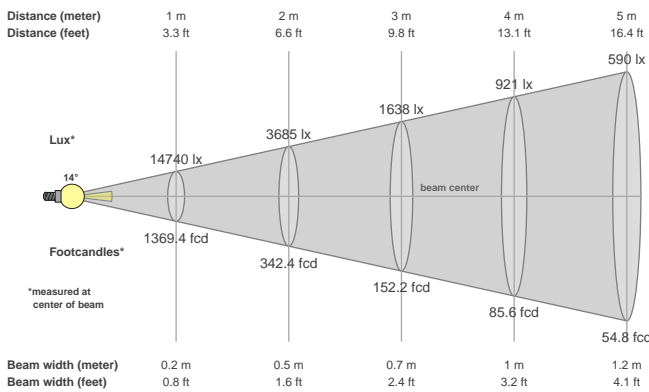


Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 592 | 0.320 | 0.331 | 0.202 | 0.314 |

Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 14.1° | 24.7° | 34.4° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 14870 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 | 14740 | 3685 | 1638 | 921 | 590 | 409 | 301 | 230 | 182 | 147 | 122 | 102 | 87 | 75 | 66 | 58 | 51 | 45 | 41 | 37 |
| FC | 1369.4 | 342.4 | 152.2 | 85.6 | 54.8 | 38 | 27.9 | 21.4 | 16.9 | 13.7 | 11.3 | 9.5 | 8.1 | 7 | 6.1 | 5.3 | 4.7 | 4.2 | 3.8 | 3.4 |

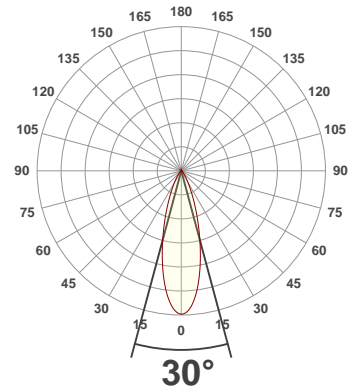
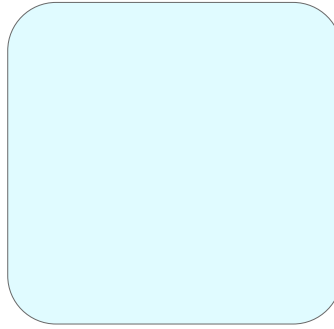
Total Lumen Output: 1077 lm

Voltage: 118 V, Current: 0.291 A

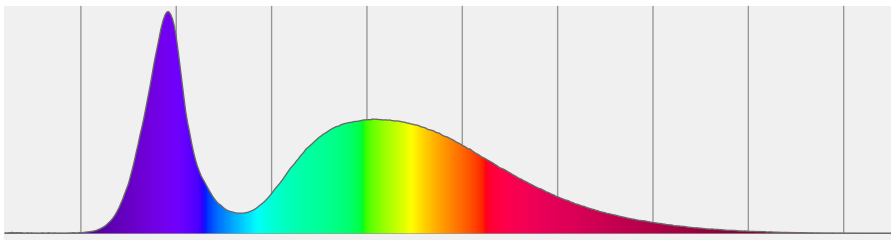
Power: 33.1 W

Efficacy: 33 Lumen/Watt

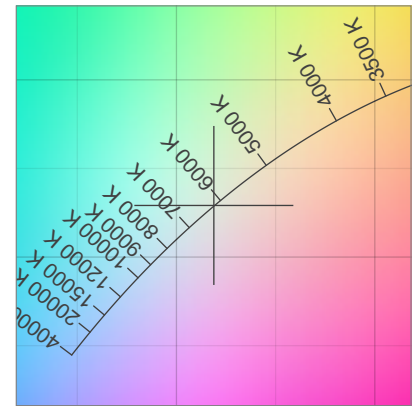
Measurement Date: 9/13/2019



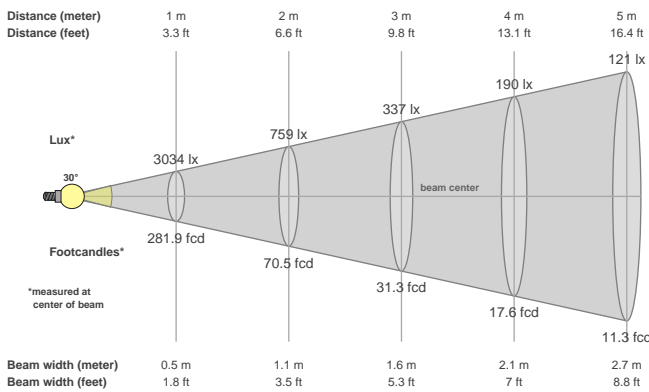
Spectral distribution



| Dominant Wavelength | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate |
|---------------------|---------------------------|---------------------------|------------------|------------------|
| nm | x | y | u | v |
| 610 | 0.319 | 0.329 | 0.202 | 0.313 |



Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 30° | 59° | 82.2° |

Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|----------------|-------------------------|------------------------|
| 3036 cd | 99.3% | 96.2% |

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 | 3034 | 759 | 337 | 190 | 121 | 84 | 62 | 47 | 37 | 30 | 25 | 21 | 18 | 15 | 13 | 12 | 10 | 9 | 8 | 8 |
| FC | 281.9 | 70.5 | 31.3 | 17.6 | 11.3 | 7.8 | 5.8 | 4.4 | 3.5 | 2.8 | 2.3 | 2 | 1.7 | 1.4 | 1.3 | 1.1 | 1 | 0.9 | 0.8 | 0.7 |

Total Lumen Output: 1296 lm

Color Temperature: 5086 K

CRI: 83.6

TLCI: 78

TM30: 84.4

CQS: 89.3

Measurement Date: 9/13/2019

Voltage: 119 V, Current: 0.599 A

Power: 70.3 W

Efficacy: 18 Lumen/Watt

High CRI Values:

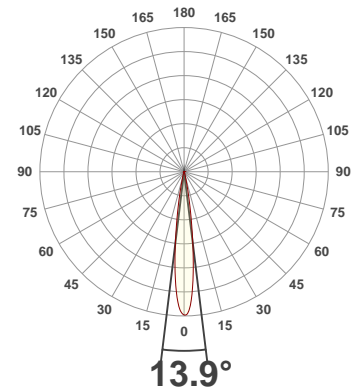
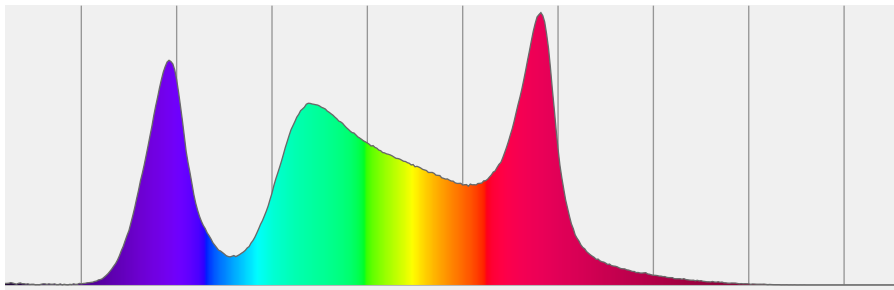
R @ 22%

G @ 30%

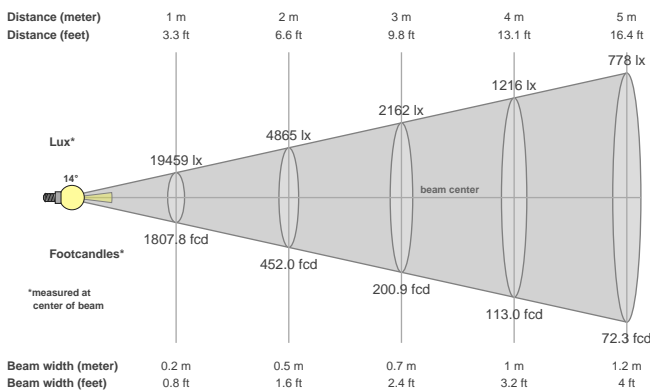
B @ 0%

W @ 100%

Spectral distribution
Dominant Wavelength 576



Beam details



Beam angles

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% |
|----------------|-----------------|-------------------|
| 13.9° | 24.3° | 32.6° |

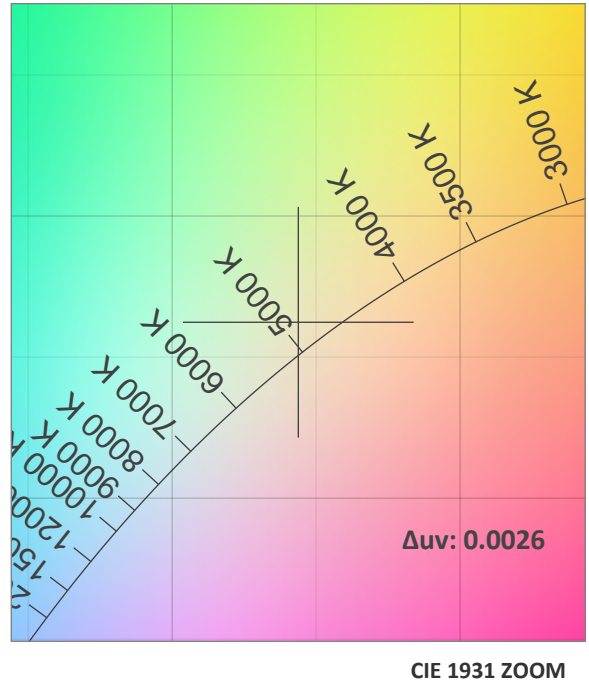
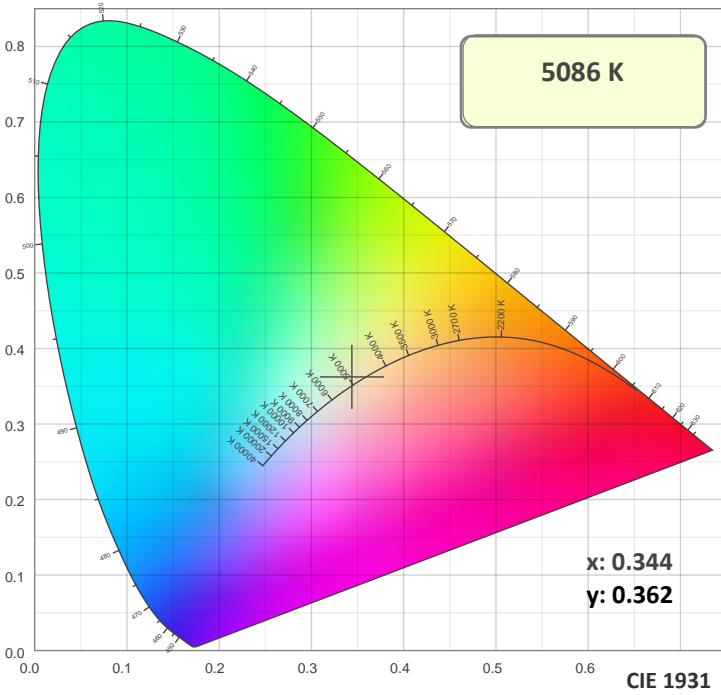
Beam intensities

| Peak intensity | Int. ratio in 120° cone | Int. ratio in 90° cone |
|-----------------|-------------------------|------------------------|
| 19508 cd | 100.0% | 99.9% |

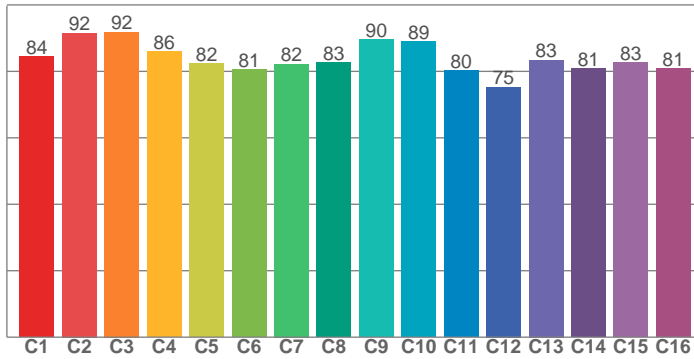
Beam Intensities from 1-20m

| 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 | 19459 | 4865 | 2162 | 1216 | 778 | 541 | 397 | 304 | 240 | 195 | 161 | 135 | 115 | 99 | 86 | 76 | 67 | 60 | 54 | 49 |
| FC | 1807.8 | 452 | 200.9 | 113 | 72.3 | 50.2 | 36.9 | 28.2 | 22.3 | 18.1 | 14.9 | 12.6 | 10.7 | 9.2 | 8 | 7.1 | 6.3 | 5.6 | 5 | 4.5 |

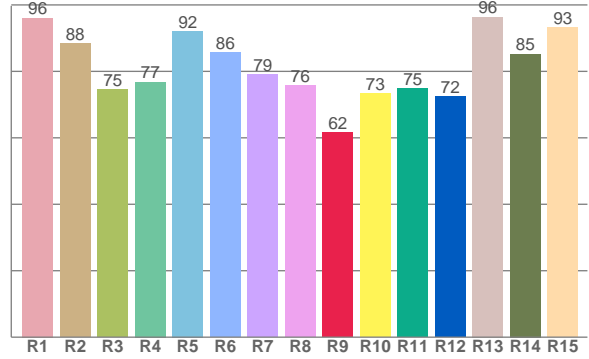
Color Details



TM30: 84.4



CRI: 83.6 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 96.1 | 88.3 | 74.6 | 76.8 | 92.2 | 85.6 | 79.1 | 75.7 | 61.6 | 73.3 | 74.9 | 72.5 | 96.4 | 85.3 | 93.3 |

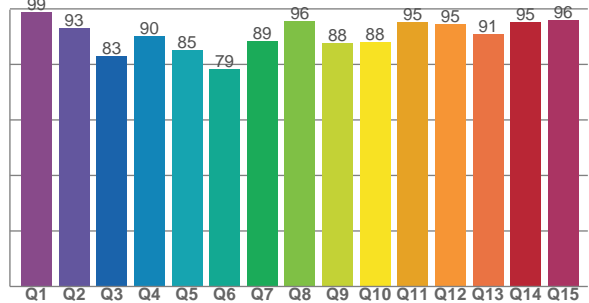
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 84.4 | 91.6 | 91.8 | 86.0 | 82.4 | 80.5 | 82.2 | 82.7 | 89.6 | 89.1 | 80.3 | 75.3 | 83.4 | 80.8 | 82.8 | 80.9 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 98.8 | 93.0 | 83.0 | 90.3 | 85.1 | 78.5 | 88.6 | 95.6 | 87.6 | 88.2 | 95.4 | 94.6 | 91.0 | 95.4 | 95.9 |

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 |
| 5086 K | 83.6 | 61.6 | 84.4 | 108.7 | 89.3 | 0.344 | 0.362 | 0.206 | 0.326 | 0.0026 |

TM30 Details

Rf 84.4
Fidelity Index Rf

Rg 108.7
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|-----|
| | | Chroma | Hue |
| 1 | 84 | 5% | -4% |
| 2 | 92 | 1% | -4% |
| 3 | 92 | 1% | 3% |
| 4 | 86 | 2% | 7% |
| 5 | 82 | 7% | 7% |
| 6 | 81 | 11% | 4% |
| 7 | 82 | 9% | -4% |
| 8 | 83 | 3% | -9% |
| 9 | 90 | -3% | -7% |
| 10 | 89 | -6% | 0% |
| 11 | 80 | -3% | 11% |
| 12 | 75 | 2% | 13% |
| 13 | 83 | 6% | 12% |
| 14 | 81 | 9% | 6% |
| 15 | 83 | 12% | 3% |
| 16 | 81 | 11% | -6% |

