

SMARTY HYBRID™

Photometric Test Report

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D O C U M E N T V E R S I O N

Due to additional product enhancements, an updated version of this document may be available online. Please check www.elationlighting.com for the latest revision/update of this report.

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Color Temperature:



Total Lumen Output:
10829 lm

Light Quality:

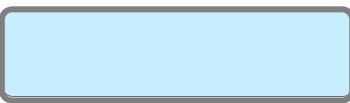


Peak:
29726249

Light Efficiency:



Power: 393 W



CIE 1931
x: 0.304
y: 0.313

Test: Beam Zoom In

Date: 6/4/2018

Voltage: 115 V

Current: 3.42 A

Frequency: 60 Hz

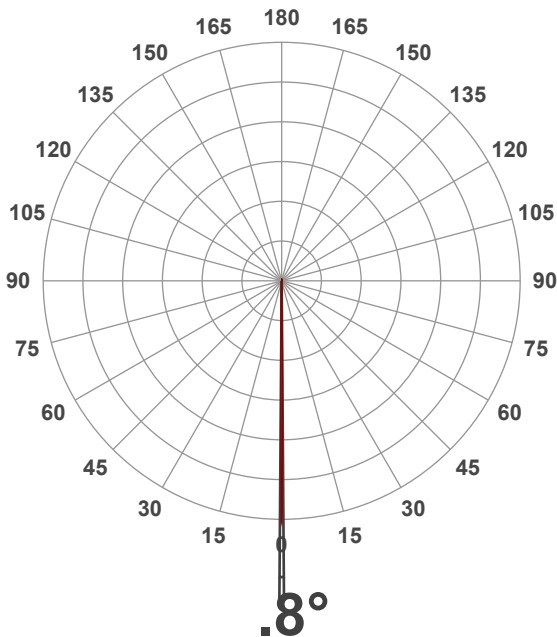
CRI: 78.1

CQS: 73.9

TM30: 77.6

Note:

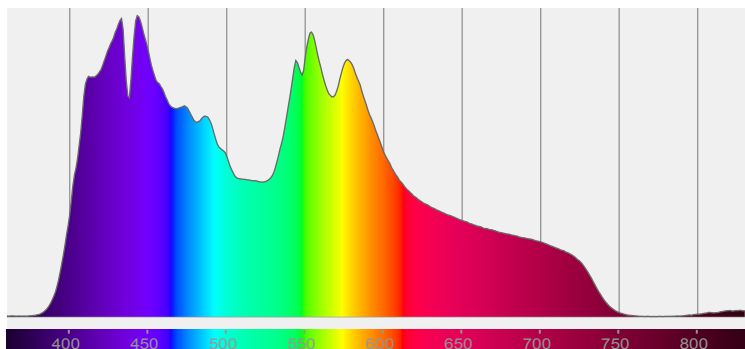
Beam Angle



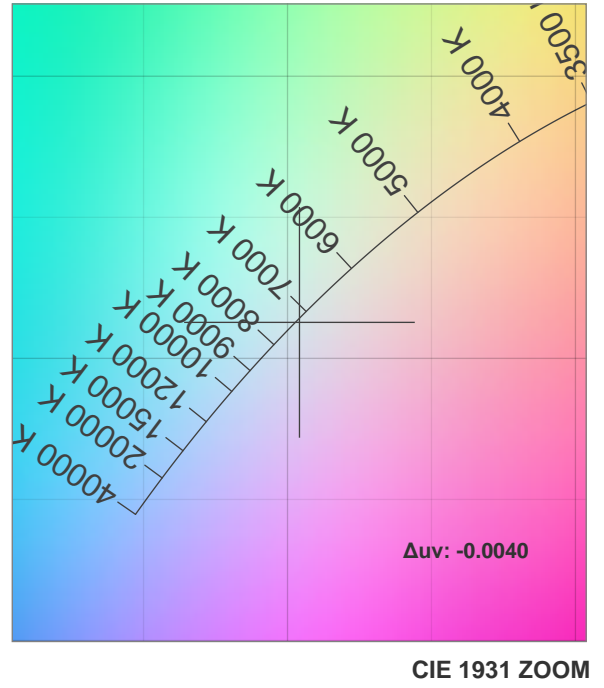
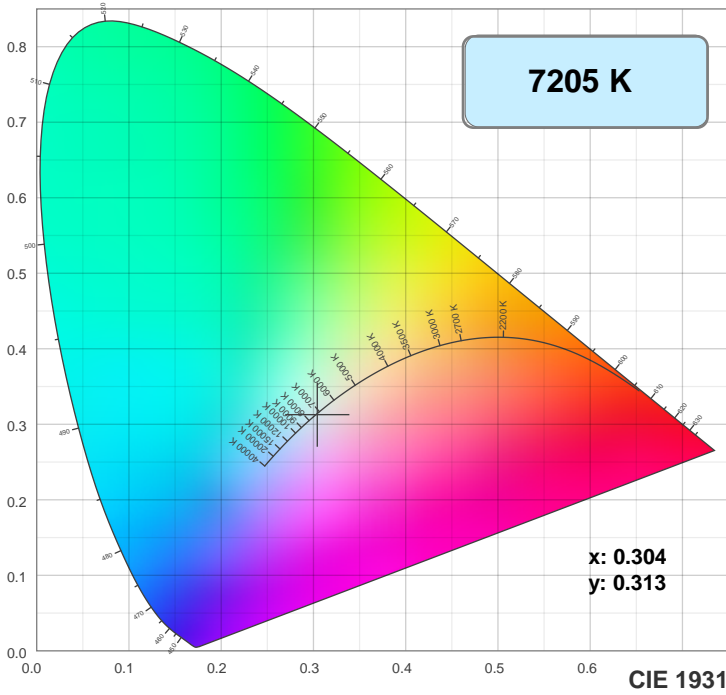
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2.5% |
|-------------------|--------------------|----------------------|
| 0.8° | 1.9° | 2.2° |

Spectra

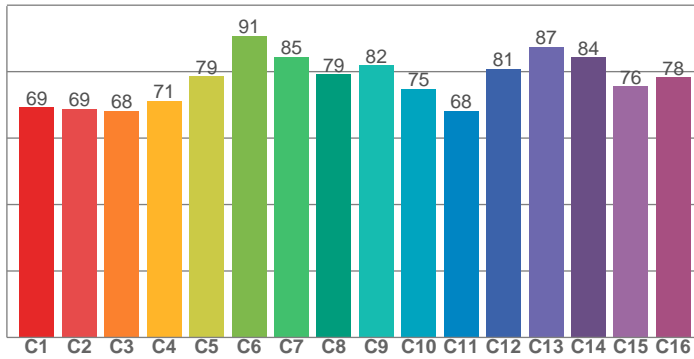
Dominant Wavelength: 455nm



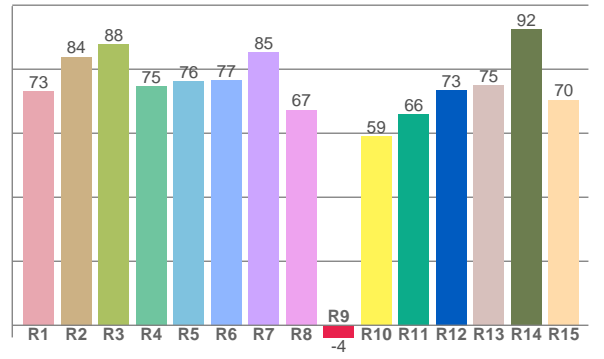
Color Details



TM30: 77.6



CRI: 78.1 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 73.0 | 83.9 | 87.8 | 74.7 | 76.2 | 76.6 | 85.3 | 67.3 | -3.8 | 59.0 | 65.9 | 73.5 | 75.0 | 92.5 | 70.5 |

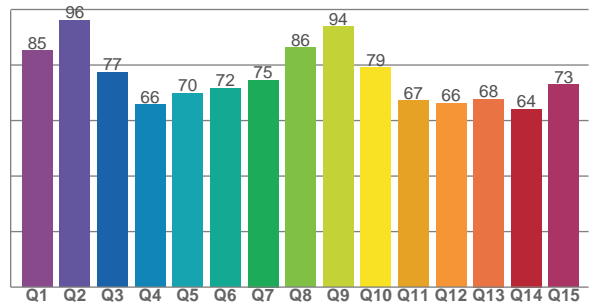
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 69.2 | 68.8 | 68.2 | 71.2 | 78.5 | 90.7 | 84.5 | 79.2 | 81.9 | 74.8 | 68.2 | 80.9 | 87.5 | 84.3 | 75.5 | 78.3 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85.3 | 96.1 | 77.4 | 65.7 | 69.8 | 71.7 | 74.6 | 86.3 | 93.8 | 79.0 | 67.2 | 66.2 | 67.8 | 64.2 | 73.0 |

CQS: 73.9



Color Parameters

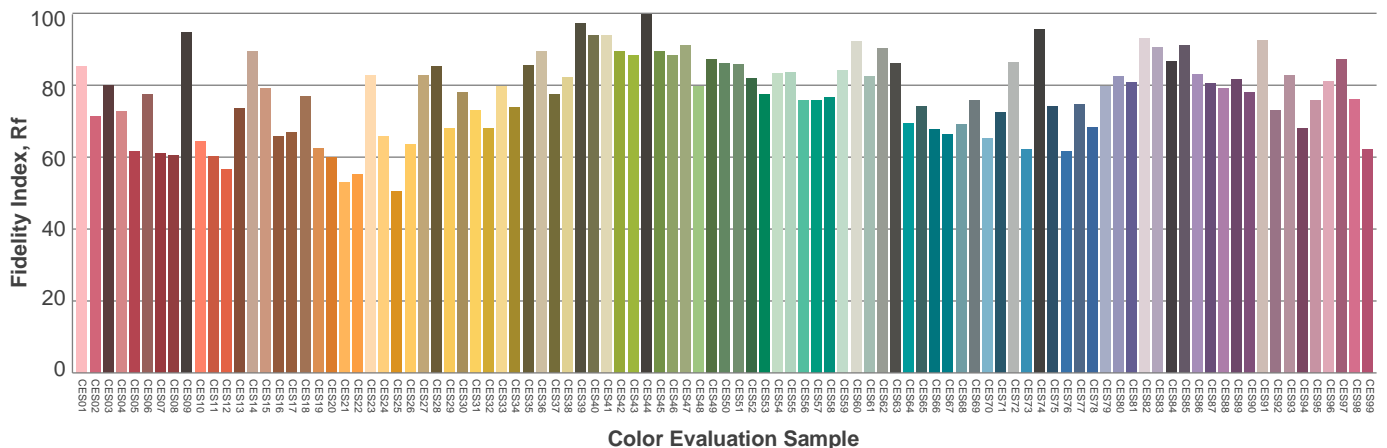
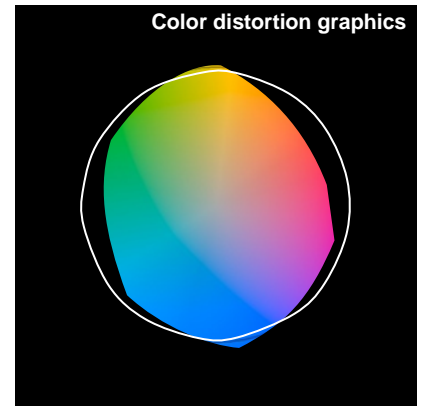
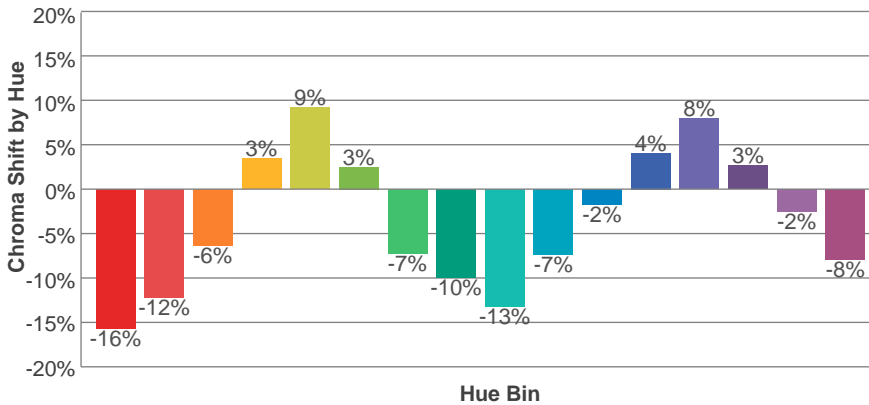
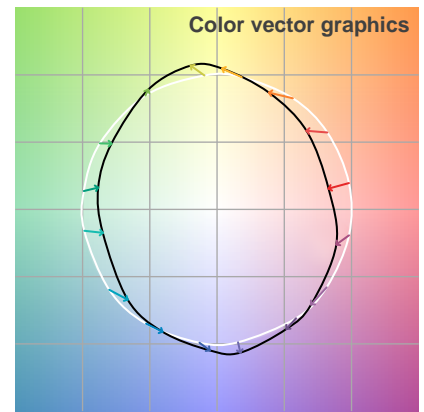
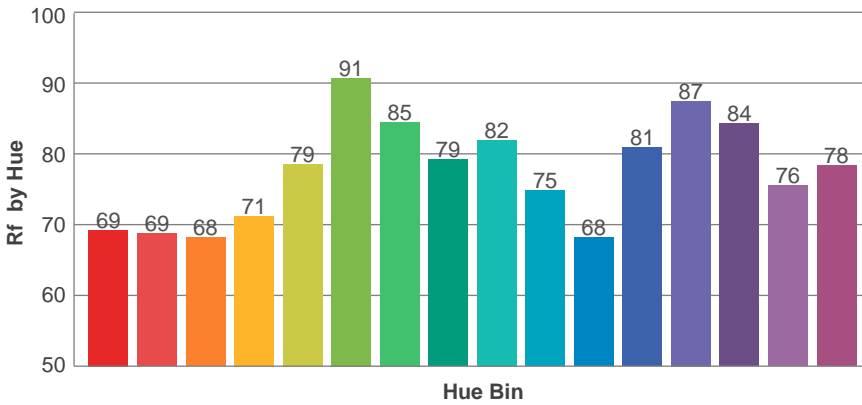
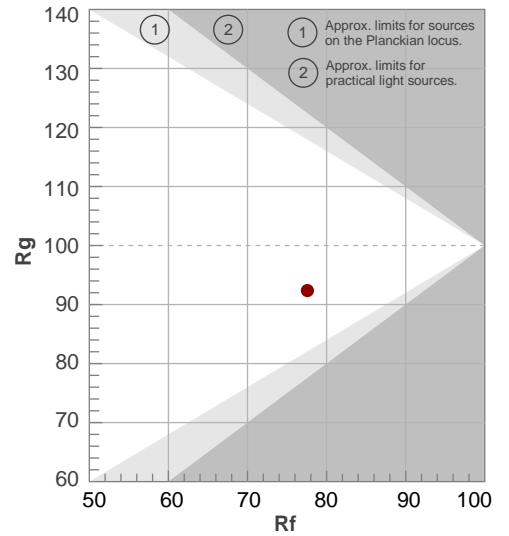
| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate | Color Coordinate | Color Deviation from Black Body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 7205 K | 78.1 | -3.8 | 77.6 | 92.4 | 73.9 | 0.304 | 0.313 | 0.198 | 0.305 | -0.0040 |

TM30 Details

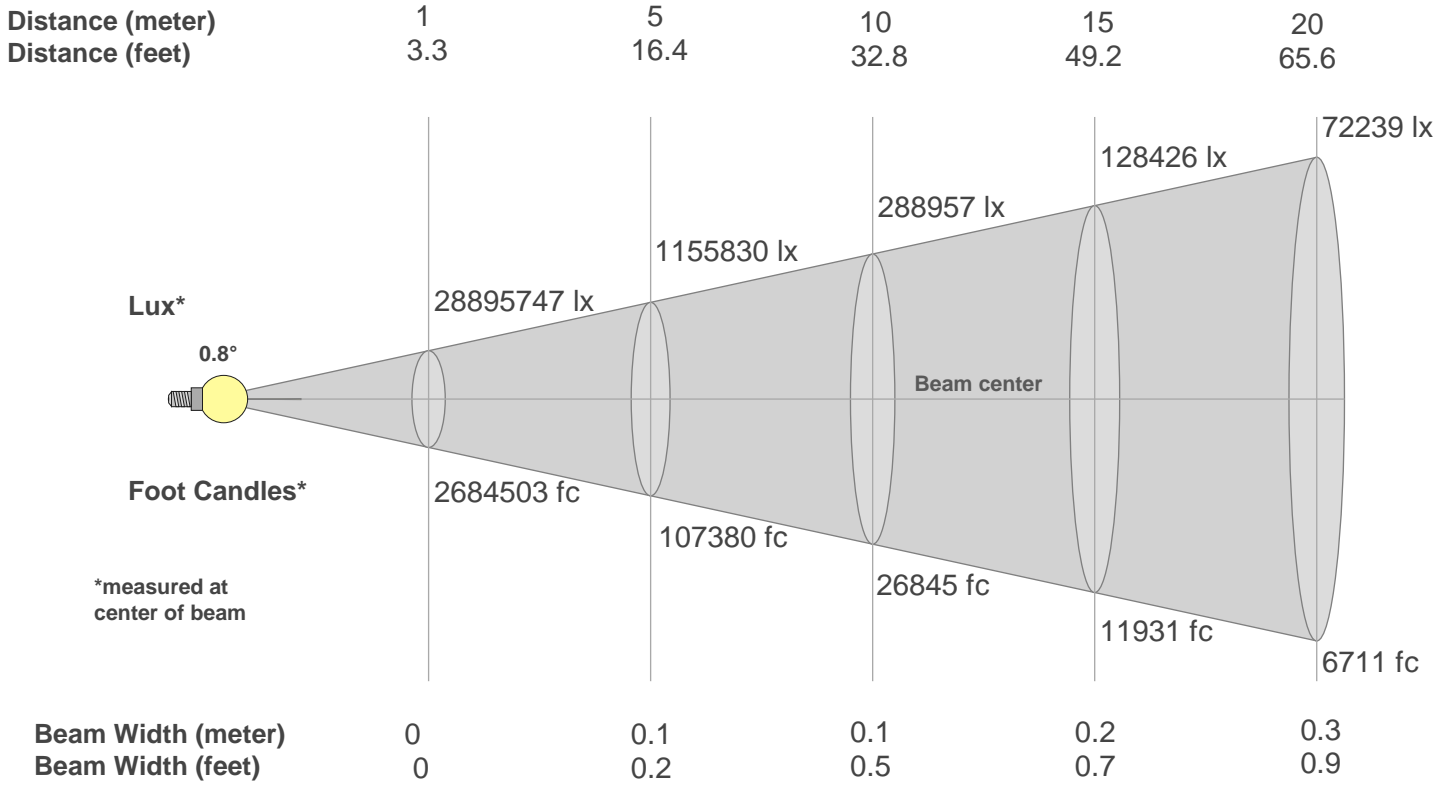
Rf 77.6
Fidelity Index Rf

Rg 92.4
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 69 | -16% | -1% |
| 2 | 69 | -12% | 10% |
| 3 | 68 | -6% | 17% |
| 4 | 71 | 3% | 16% |
| 5 | 79 | 9% | 9% |
| 6 | 91 | 3% | -4% |
| 7 | 85 | -7% | -5% |
| 8 | 79 | -10% | -5% |
| 9 | 82 | -13% | 4% |
| 10 | 75 | -7% | 14% |
| 11 | 68 | -2% | 13% |
| 12 | 81 | 4% | 9% |
| 13 | 87 | 8% | 0% |
| 14 | 84 | 3% | -10% |
| 15 | 76 | -2% | -17% |
| 16 | 78 | -8% | -9% |



Beam Details



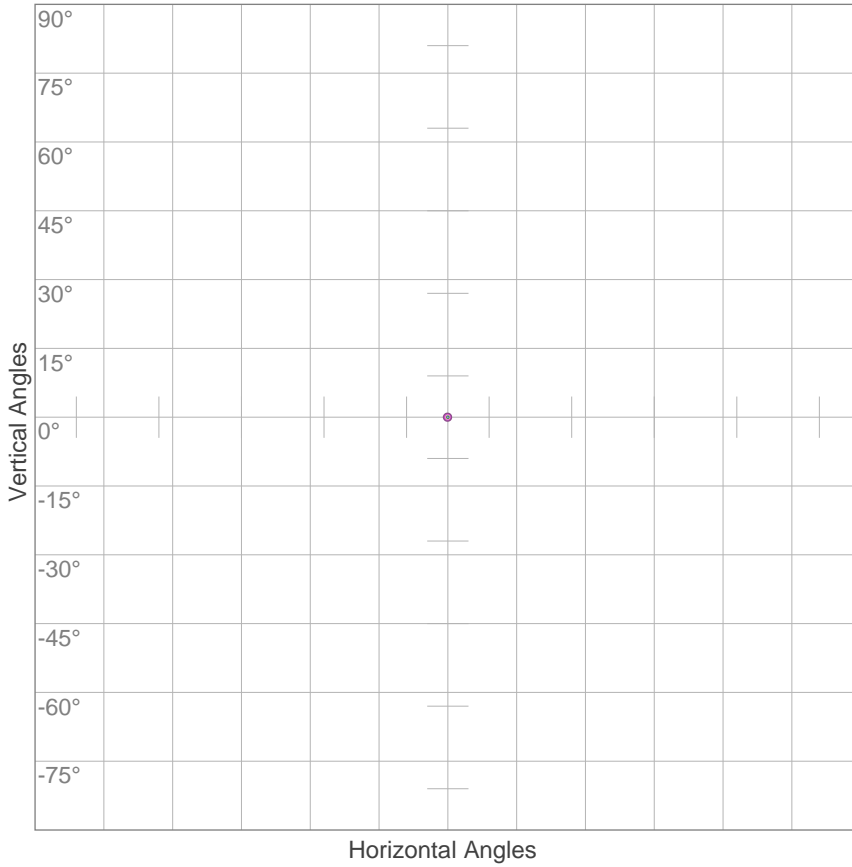
Beam Intensities from 1-20m

| 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 | 288957 47 | 722393 7 | 321063 9 | 180598 4 | 115583 0 | 802660 | 589709 | 451496 | 356738 | 288957 | 238808 | 200665 | 170981 | 147427 | 128426 | 112874 | 99985 | 89184 | 80044 | 72239 |
| fc | 268450 2.8 | 671125 7 | 298278 1 | 167781 4 | 107380 1 | 74569.5 | 54785.8 | 41945.4 | 33142 | 26845 | 22186 | 18642.4 | 15884.6 | 13696.4 | 11931.1 | 10486.3 | 9288.9 | 8285.5 | 7436.3 | 6711.3 |

| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2,5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 0.8° | 1.9° | 2.2° | 89.1% | 87.5% |

ISO Diagrams

ISO Candela Diagram



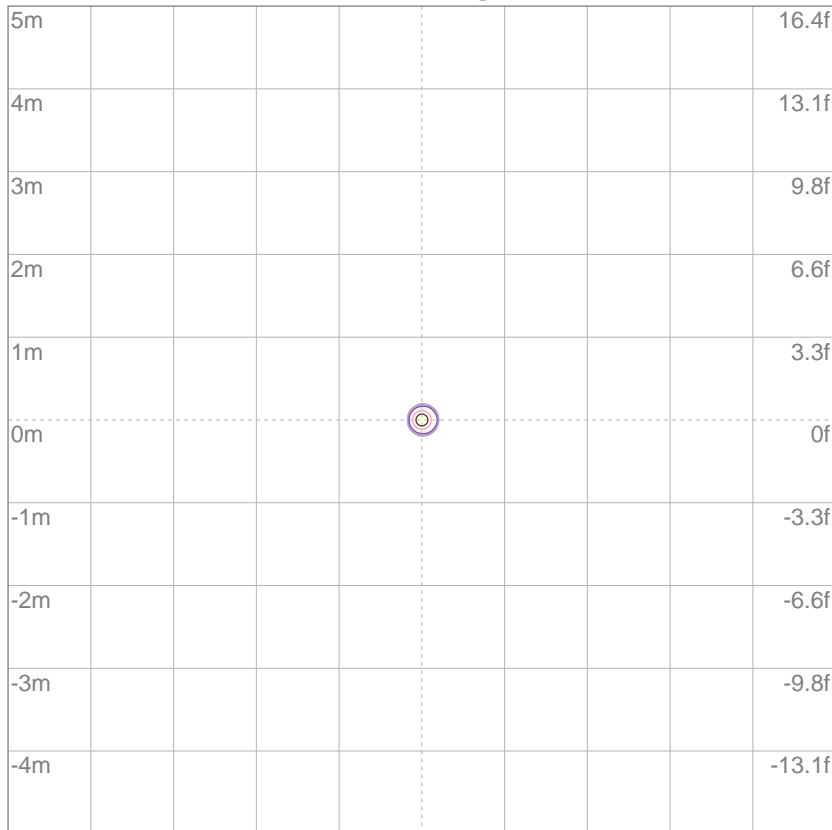
| | |
|-----|-------------|
| 10% | 2889575 cd |
| 20% | 5779149 cd |
| 30% | 8668724 cd |
| 40% | 11558299 cd |
| 50% | 14447873 cd |
| 60% | 17337448 cd |
| 70% | 20227023 cd |
| 80% | 23116598 cd |
| 90% | 26006172 cd |

Conditions:

Number of c-planes: 2

Candela at center: 28895747 cd

ISO Lux Diagram



| | |
|-----|----------|
| 3% | 8669 lx |
| 5% | 14.4K lx |
| 10% | 28.9K lx |
| 30% | 86.7K lx |
| 50% | 144K lx |

Conditions:

Number of c-planes: 2

Lux at center: 289K lx

Lux distribution on a surface when lamp is mounted at 10 meters from the surface.

Mounting Height: 10 meters (33 feet)

Color Temperature:



Total Lumen Output:
9258 lm

Light Quality:

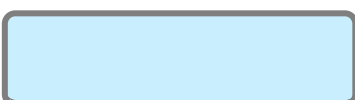


Peak:
360399 cd

Light Efficiency:



Power: 394 W



CIE 1931
x: 0.305
y: 0.313

Test: Beam Zoom Out

Date: 6/4/2018

Voltage: 115 V

Current: 3.42 A

Frequency: 60 Hz

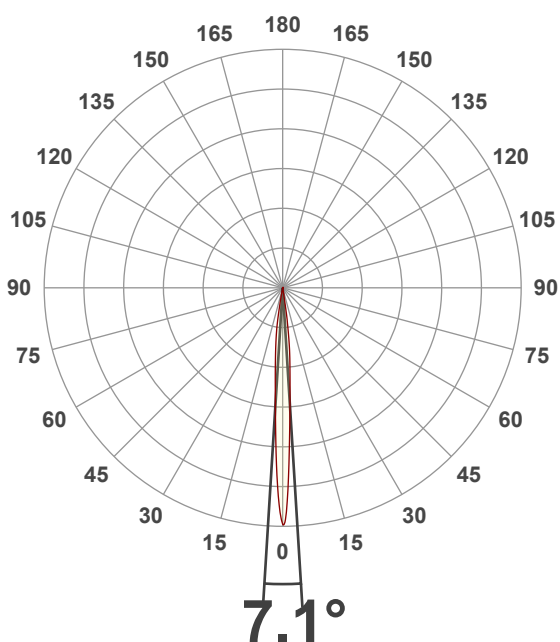
CRI: 78.8

CQS: 74.7

TM30: 78.3

Note:

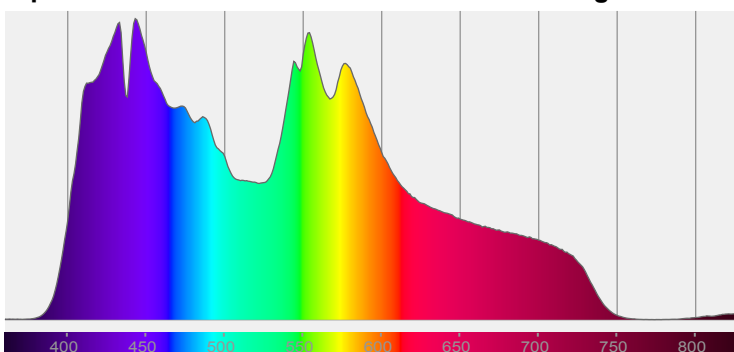
Beam Angle



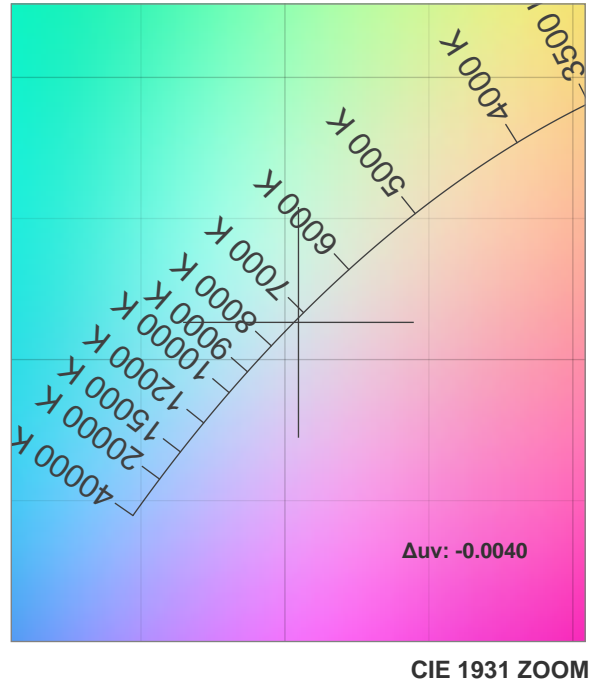
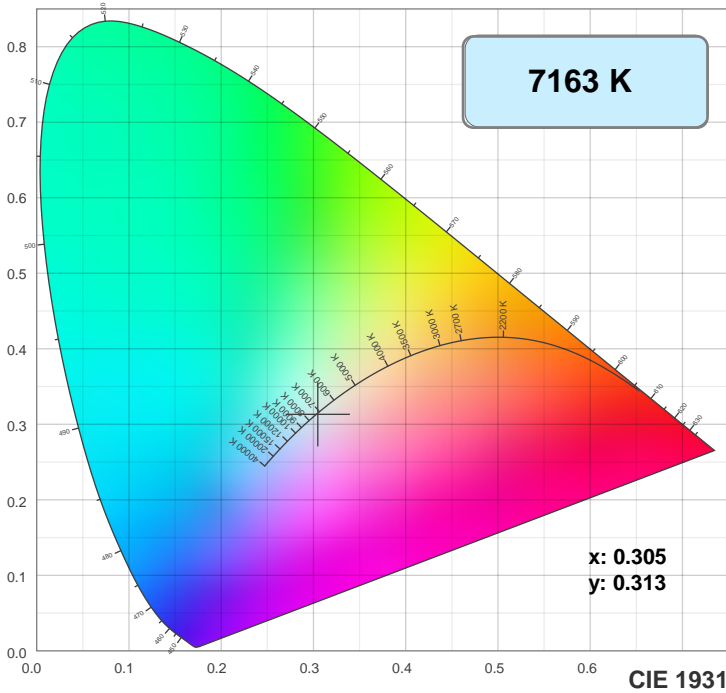
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2.5% |
|-------------------|--------------------|----------------------|
| 7.1° | 17.6° | 19.4° |

Spectra

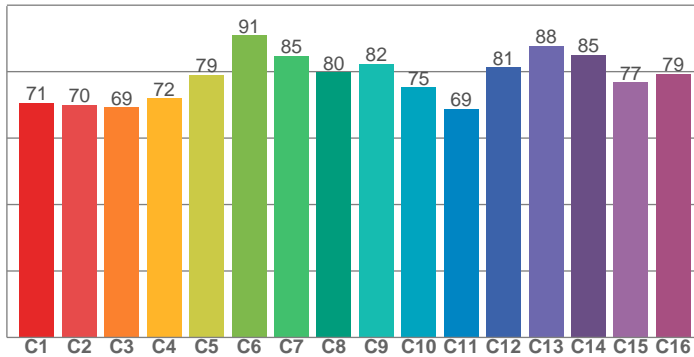
Dominant Wavelength: 451nm



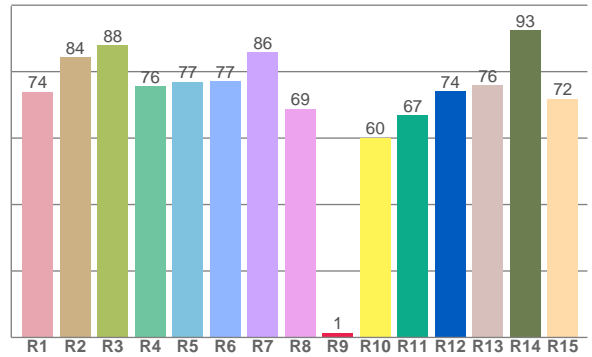
Color Details



TM30: 78.3



CRI: 78.8 (R1-R8)



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

| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|
| 74.0 | 84.4 | 87.9 | 75.5 | 77.0 | 77.2 | 85.8 | 68.8 | 1.4 | 60.1 | 66.8 | 74.1 | 75.9 | 92.5 | 71.9 |

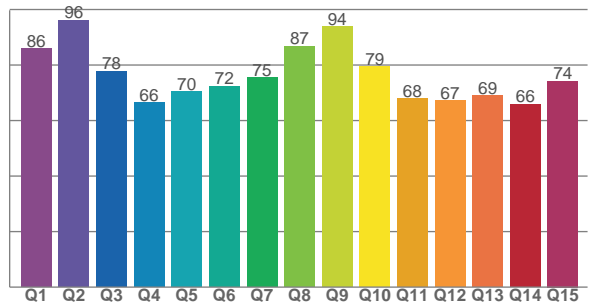
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 70.6 | 70.0 | 69.3 | 71.9 | 79.1 | 91.0 | 84.8 | 79.8 | 82.4 | 75.3 | 68.8 | 81.2 | 87.8 | 85.1 | 76.8 | 79.3 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85.9 | 96.1 | 77.7 | 66.4 | 70.5 | 72.3 | 75.4 | 86.8 | 93.8 | 79.4 | 68.0 | 67.2 | 68.9 | 65.9 | 74.3 |

CQS: 74.7



Color Parameters

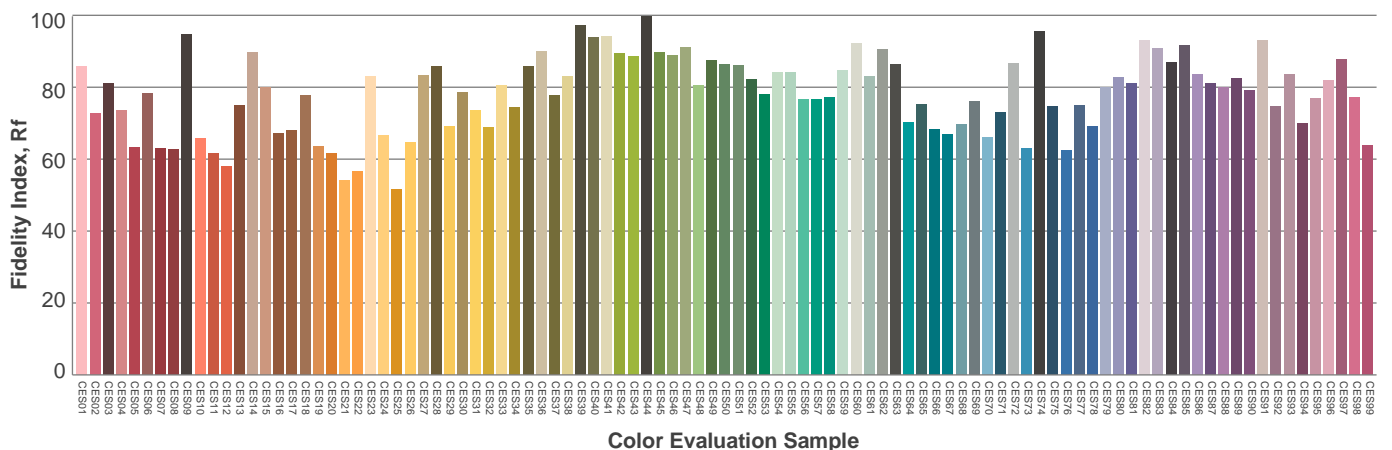
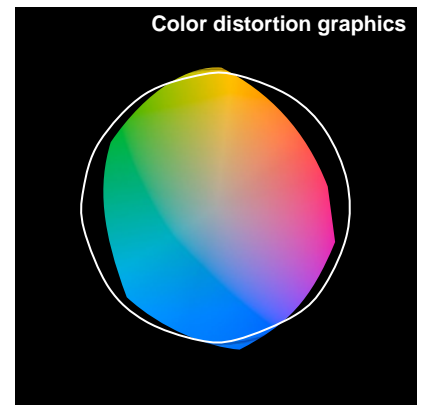
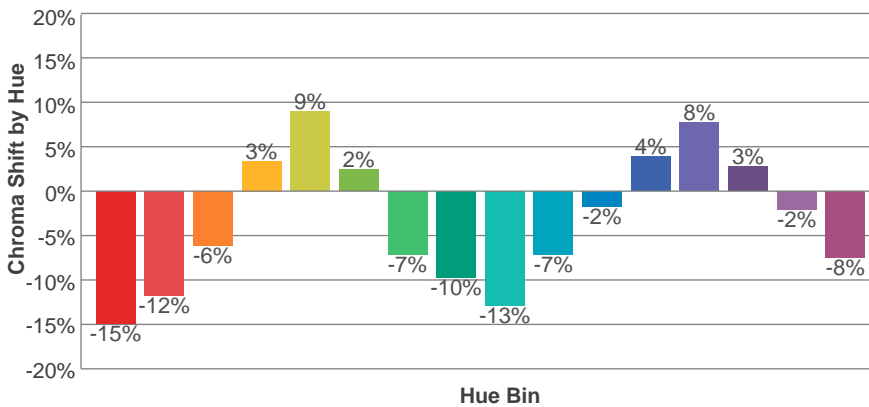
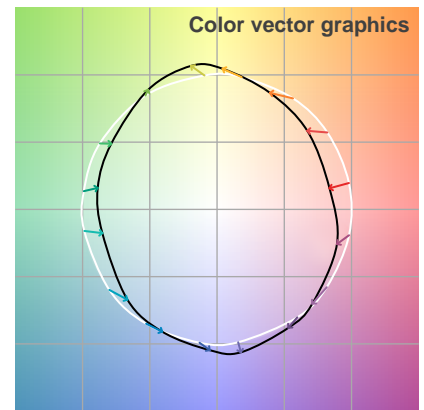
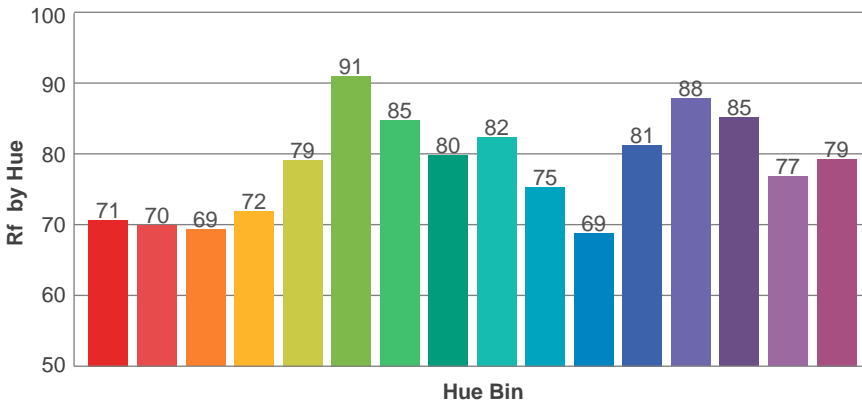
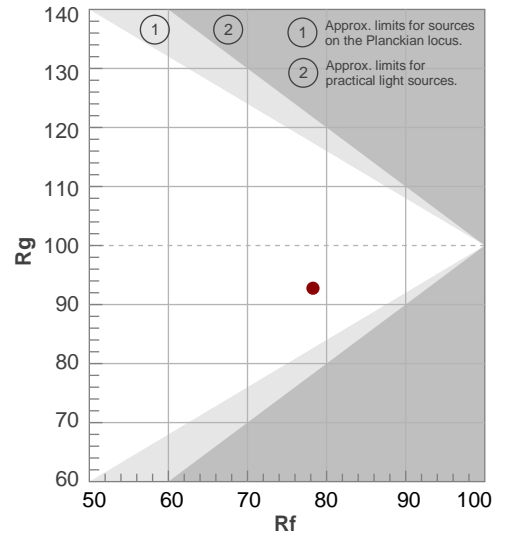
| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate | Color Coordinate | Color Deviation from Black Body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 7163 K | 78.8 | 1.4 | 78.3 | 92.8 | 74.7 | 0.305 | 0.313 | 0.198 | 0.306 | -0.0040 |

TM30 Details

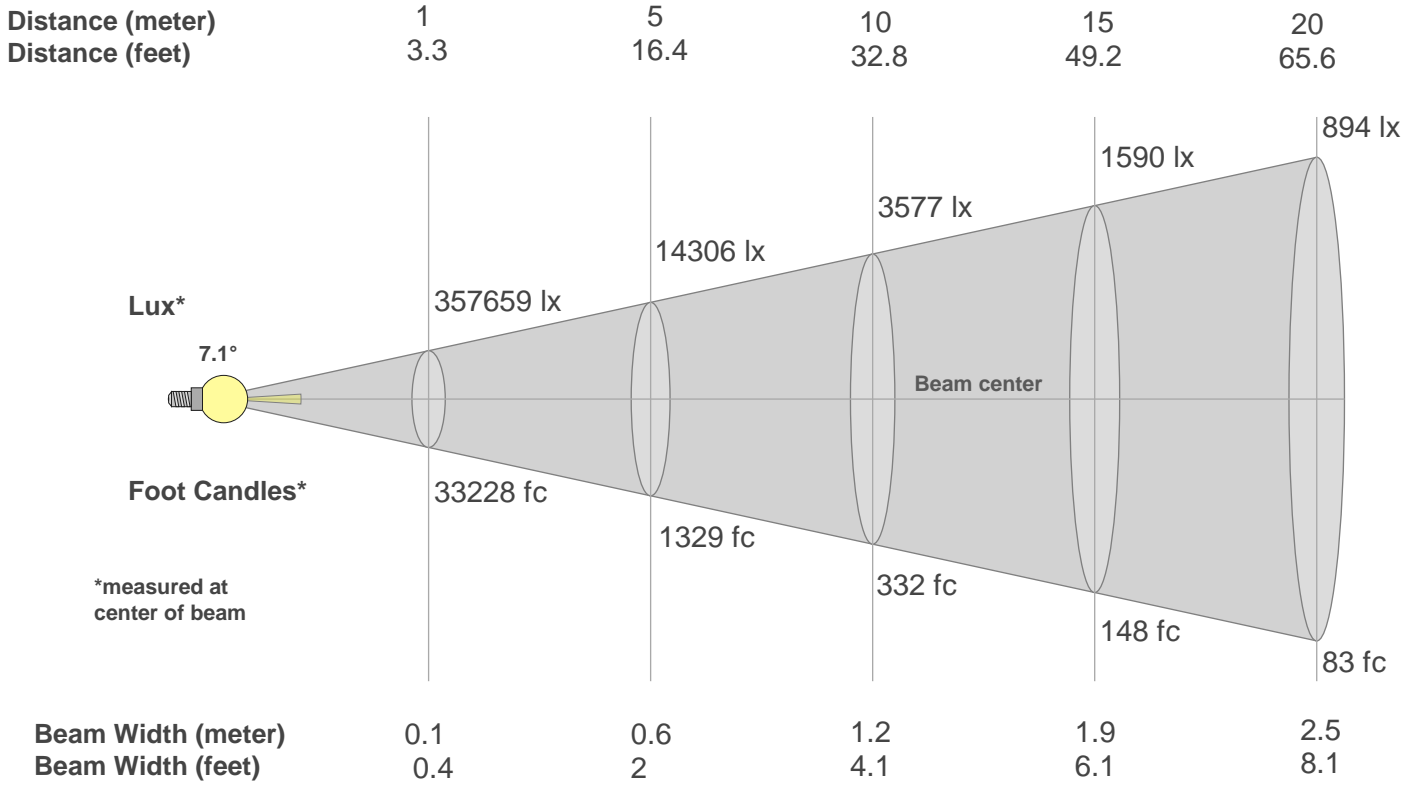
Rf 78.3
Fidelity Index Rf

Rg 92.8
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 71 | -15% | -1% |
| 2 | 70 | -12% | 9% |
| 3 | 69 | -6% | 17% |
| 4 | 72 | 3% | 15% |
| 5 | 79 | 9% | 8% |
| 6 | 91 | 2% | -4% |
| 7 | 85 | -7% | -5% |
| 8 | 80 | -10% | -4% |
| 9 | 82 | -13% | 4% |
| 10 | 75 | -7% | 13% |
| 11 | 69 | -2% | 13% |
| 12 | 81 | 4% | 9% |
| 13 | 88 | 8% | 1% |
| 14 | 85 | 3% | -10% |
| 15 | 77 | -2% | -16% |
| 16 | 79 | -8% | -8% |



Beam Details



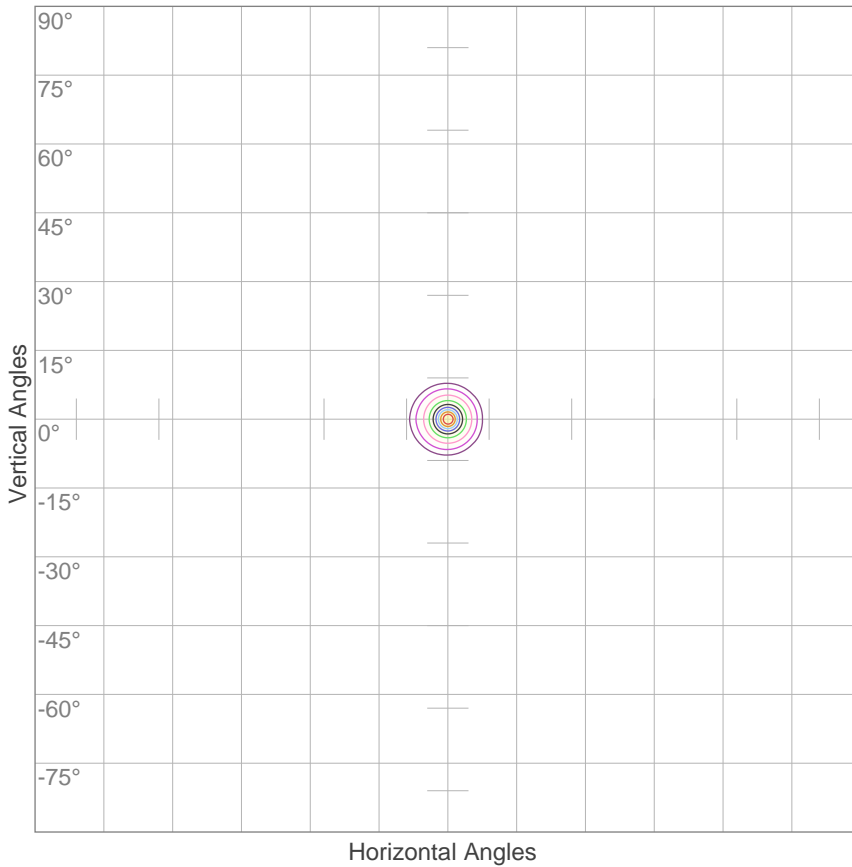
Beam Intensities from 1-20m

| 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 | 357659 | 89415 | 39740 | 22354 | 14306 | 9935 | 7299 | 5588 | 4416 | 3577 | 2956 | 2484 | 2116 | 1825 | 1590 | 1397 | 1238 | 1104 | 991 | 894 |
| fc | 33227.6 | 8306.9 | 3692 | 2076.7 | 1329.1 | 923 | 678.1 | 519.2 | 410.2 | 332.3 | 274.6 | 230.7 | 196.6 | 169.5 | 147.7 | 129.8 | 115 | 102.6 | 92 | 83.1 |

| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2,5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 7.1° | 17.6° | 19.4° | 99.8% | 99.8% |

ISO Diagrams

ISO Candela Diagram



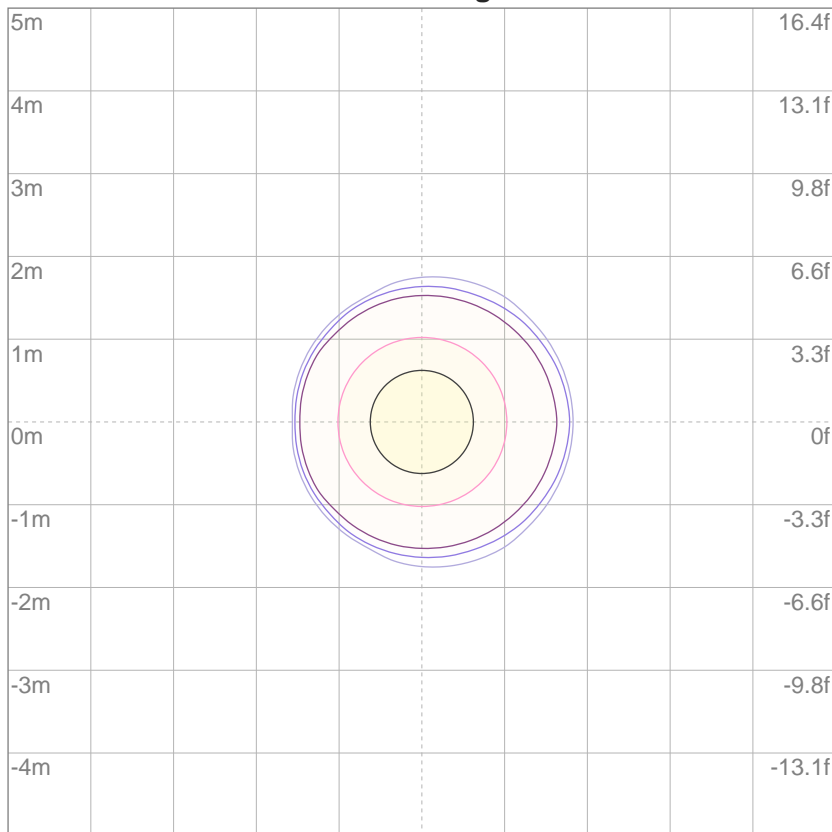
| | |
|-----|-----------|
| 10% | 35766 cd |
| 20% | 71532 cd |
| 30% | 107298 cd |
| 40% | 143063 cd |
| 50% | 178829 cd |
| 60% | 214595 cd |
| 70% | 250361 cd |
| 80% | 286127 cd |
| 90% | 321893 cd |

Conditions:

Number of c-planes: 2

Candela at center: 357659 cd

ISO Lux Diagram



| | |
|-----|---------|
| 3% | 107 lx |
| 5% | 179 lx |
| 10% | 358 lx |
| 30% | 1073 lx |
| 50% | 1788 lx |

Conditions:

Number of c-planes: 2

Lux at center: 3577 lx

Lux distribution on a surface when lamp is mounted at 10 meters from the surface.

Mounting Height: 10 meters (33 feet)

Smarty Hybrid



Color Temperature:



Total Lumen Output:
4751 lm

Light Quality:

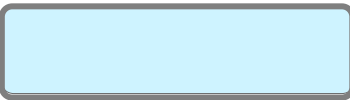


Peak:
3429303 cd

Light Efficiency:



Power: 394 W



CIE 1931
x: 0.309
y: 0.319

Test: Spot Zoom In

Date: 6/4/2018

Voltage: 115 V

Current: 3.41 A

Frequency: 60 Hz

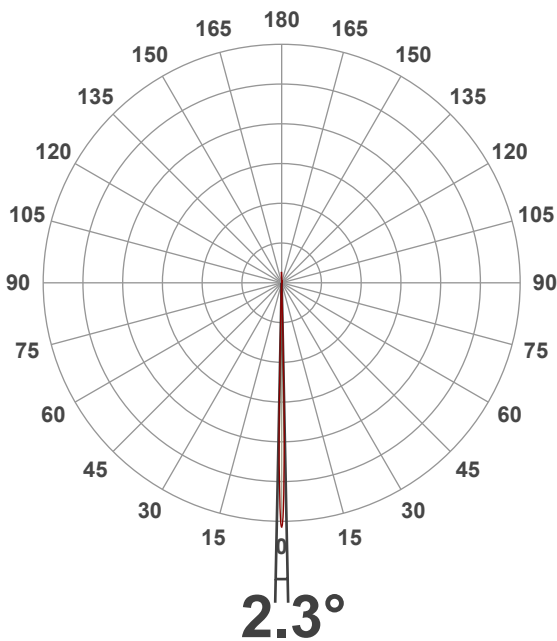
CRI: 77.9

CQS: 74.2

TM30: 77.7

Note:

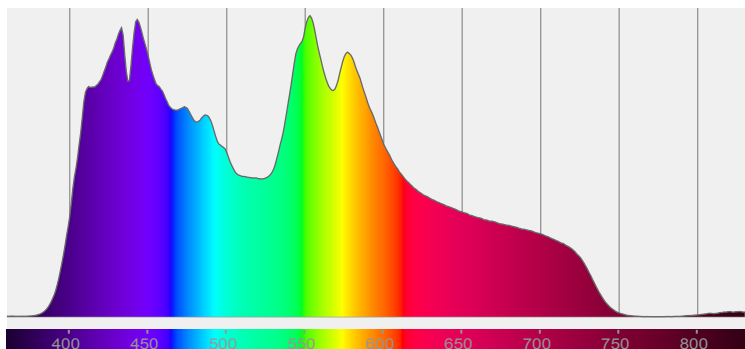
Beam Angle



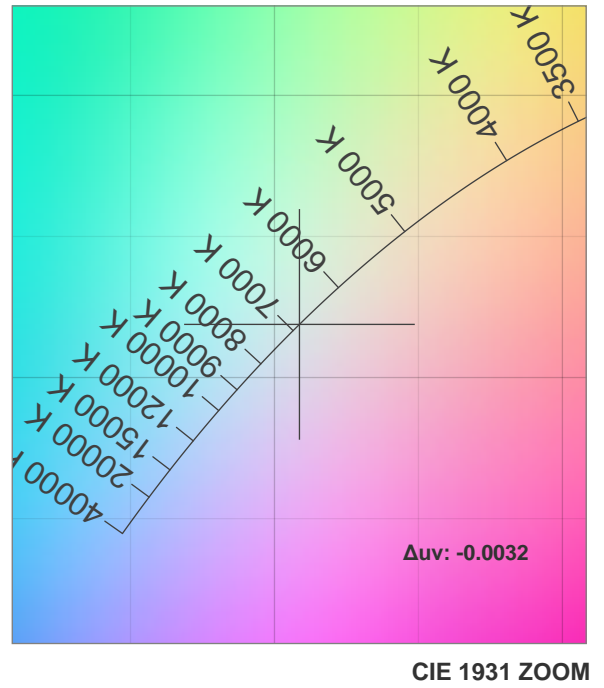
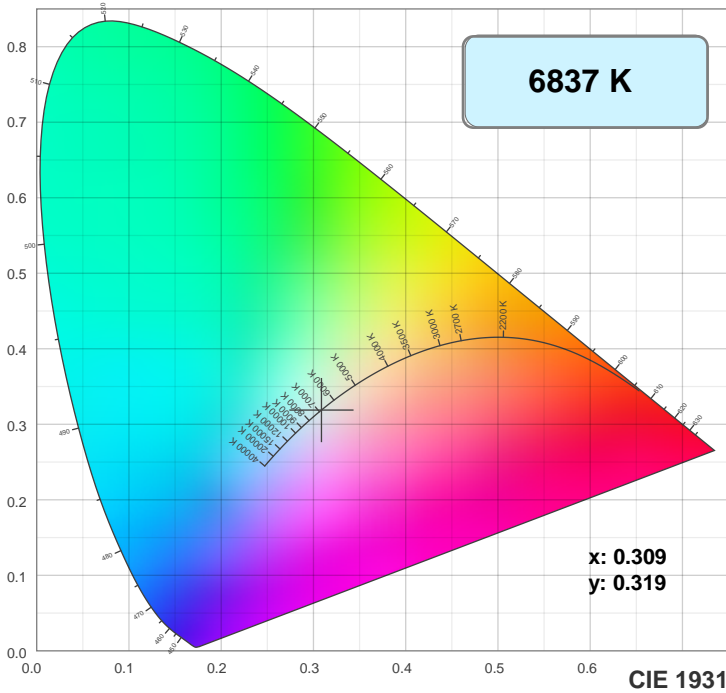
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2.5% |
|-------------------|--------------------|----------------------|
| 2.3° | 3.4° | 3.9° |

Spectra

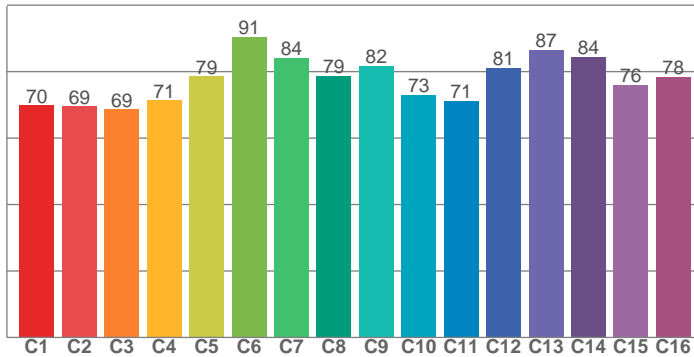
Dominant Wavelength: 360nm



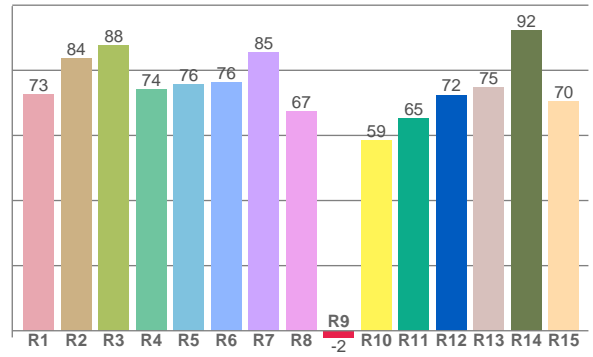
Color Details



TM30: 77.7



CRI: 77.9 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 72.7 | 83.7 | 87.6 | 74.3 | 75.7 | 76.2 | 85.4 | 67.4 | -2.1 | 58.5 | 65.2 | 72.5 | 74.7 | 92.4 | 70.5 |

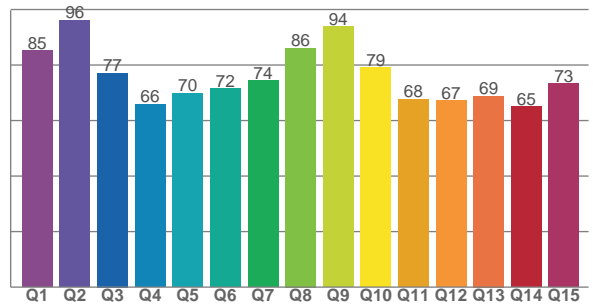
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 69.8 | 69.5 | 68.7 | 71.4 | 78.6 | 90.5 | 84.1 | 78.8 | 81.7 | 73.0 | 71.1 | 81.1 | 86.6 | 84.5 | 76.0 | 78.5 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85.2 | 96.2 | 77.2 | 65.8 | 69.9 | 71.5 | 74.4 | 86.1 | 93.8 | 79.2 | 67.7 | 67.2 | 68.9 | 65.0 | 73.3 |

CQS: 74.2



Color Parameters

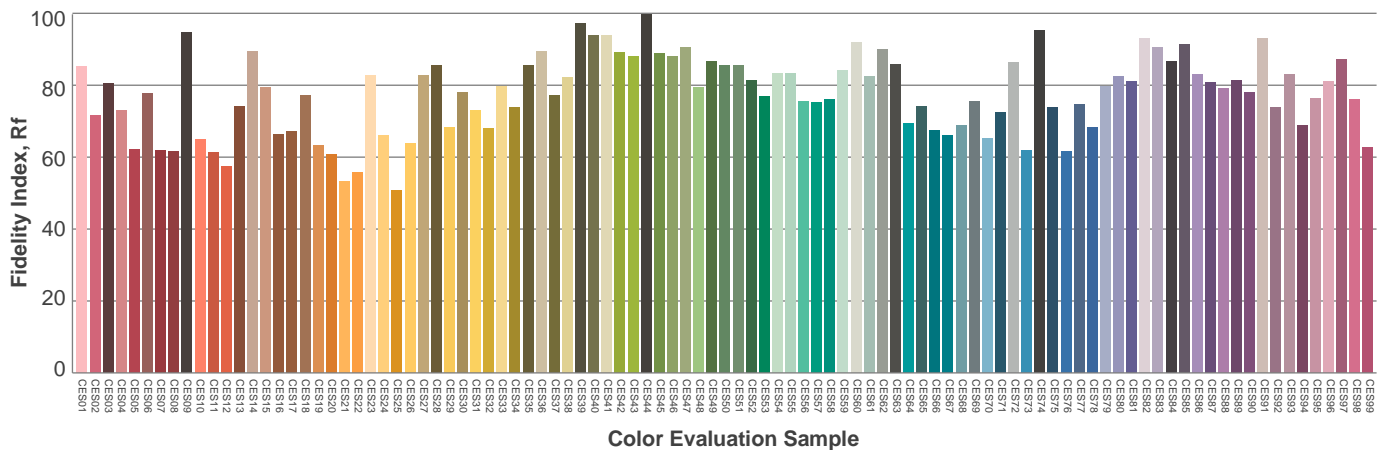
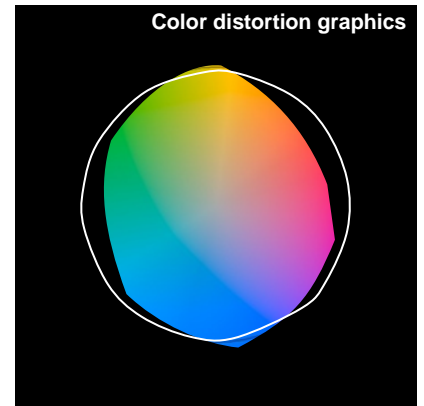
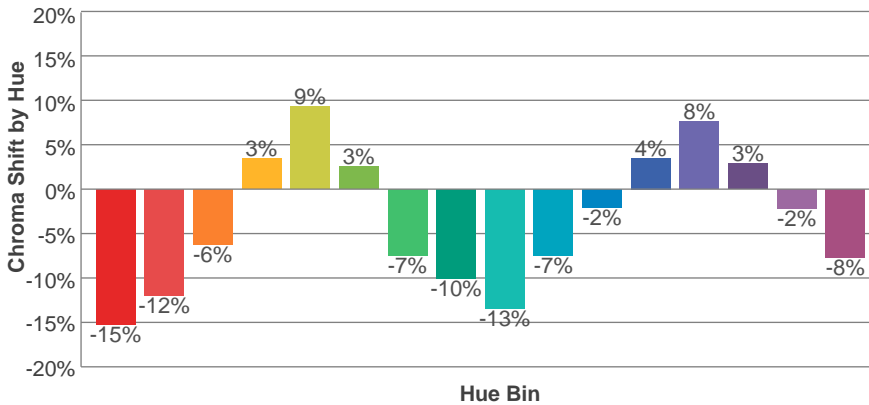
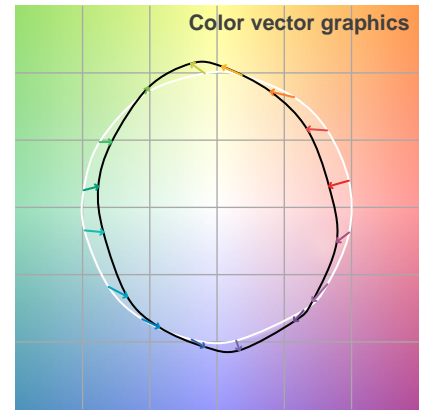
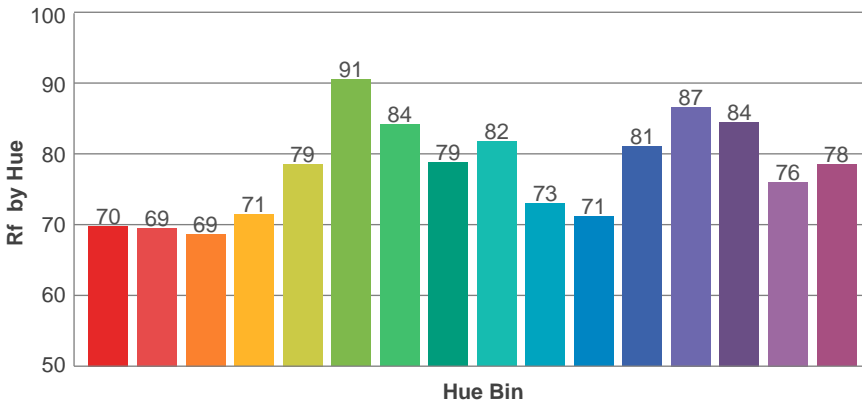
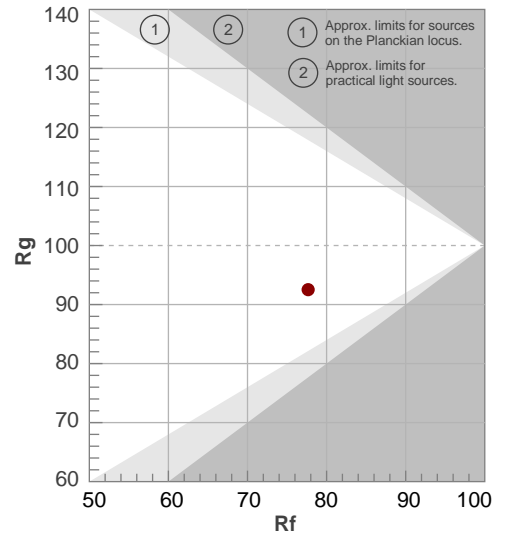
| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate | Color Coordinate | Color Deviation from Black Body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 6837 K | 77.9 | -2.1 | 77.7 | 92.5 | 74.2 | 0.309 | 0.319 | 0.199 | 0.308 | -0.0032 |

TM30 Details

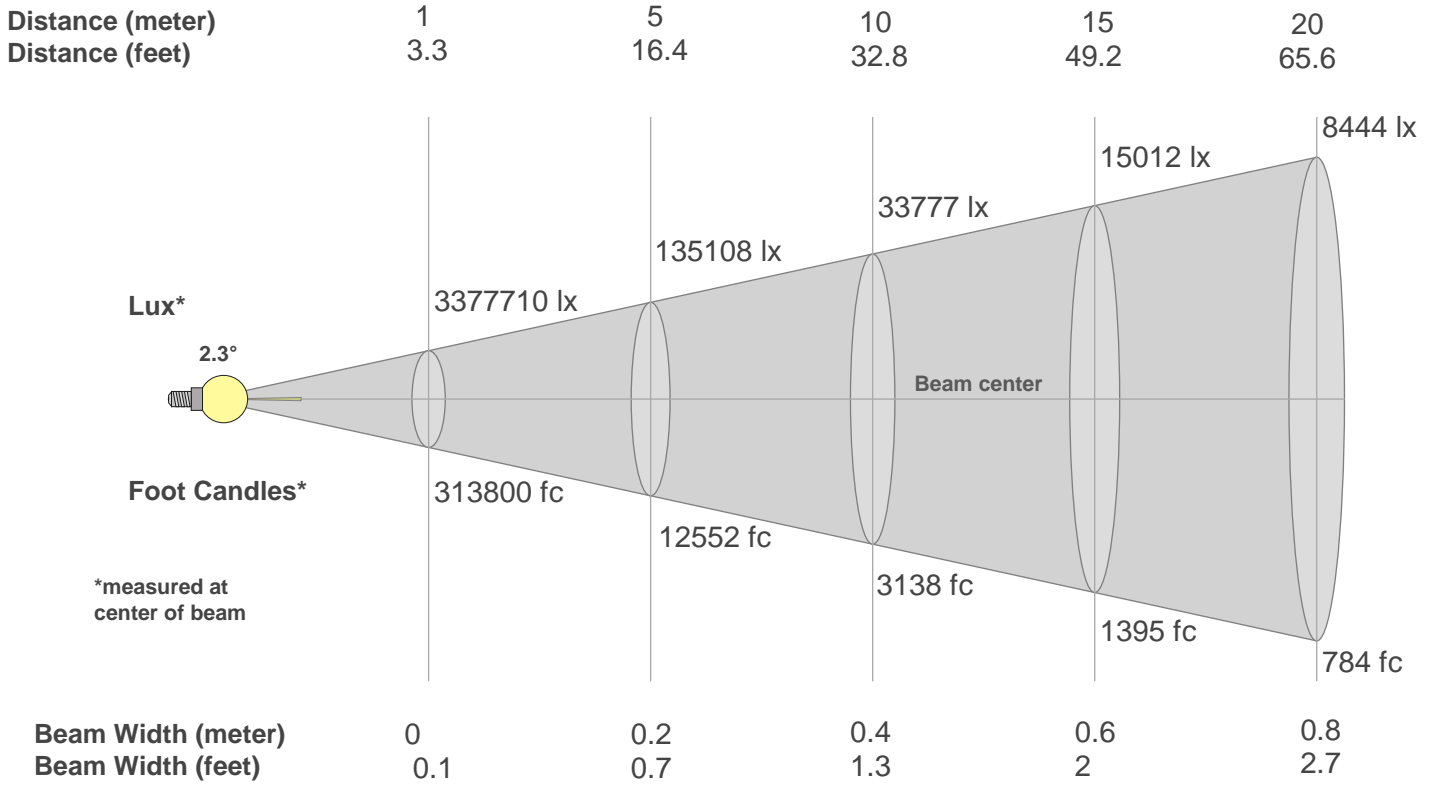
Rf 77.7
Fidelity Index Rf

Rg 92.5
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 70 | -15% | -1% |
| 2 | 69 | -12% | 9% |
| 3 | 69 | -6% | 17% |
| 4 | 71 | 3% | 15% |
| 5 | 79 | 9% | 9% |
| 6 | 91 | 3% | -4% |
| 7 | 84 | -7% | -5% |
| 8 | 79 | -10% | -5% |
| 9 | 82 | -13% | 4% |
| 10 | 73 | -7% | 14% |
| 11 | 71 | -2% | 14% |
| 12 | 81 | 4% | 11% |
| 13 | 87 | 8% | 1% |
| 14 | 84 | 3% | -10% |
| 15 | 76 | -2% | -17% |
| 16 | 78 | -8% | -9% |



Beam Details



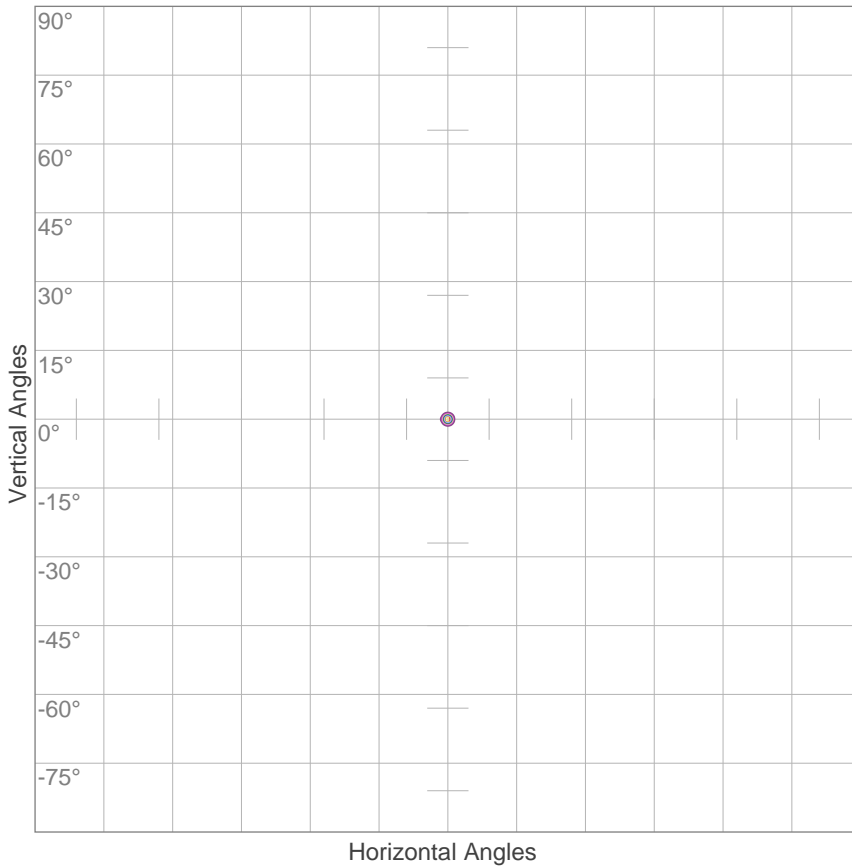
Beam Intensities from 1-20m

| | | | | | | | | | | | | | | | | | | | | |
|----|----------|---------|---------|---------|--------|--------|--------|--------|--------|-------|--------|--------|--------|-------|--------|--------|--------|-------|-------|-------|
| 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 | 3377710 | 844428 | 375301 | 211107 | 135108 | 93825 | 68933 | 52777 | 41700 | 33777 | 27915 | 23456 | 19986 | 17233 | 15012 | 13194 | 11688 | 10425 | 9357 | 8444 |
| fc | 313799.6 | 78449.9 | 34866.6 | 19612.5 | 12552 | 8716.7 | 6404.1 | 4903.1 | 3874.1 | 3138 | 2593.4 | 2179.2 | 1856.8 | 1601 | 1394.7 | 1225.8 | 1085.8 | 968.5 | 869.3 | 784.5 |

| | | | | |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2,5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
| 2.3° | 3.4° | 3.9° | 100.0% | 99.9% |

ISO Diagrams

ISO Candela Diagram



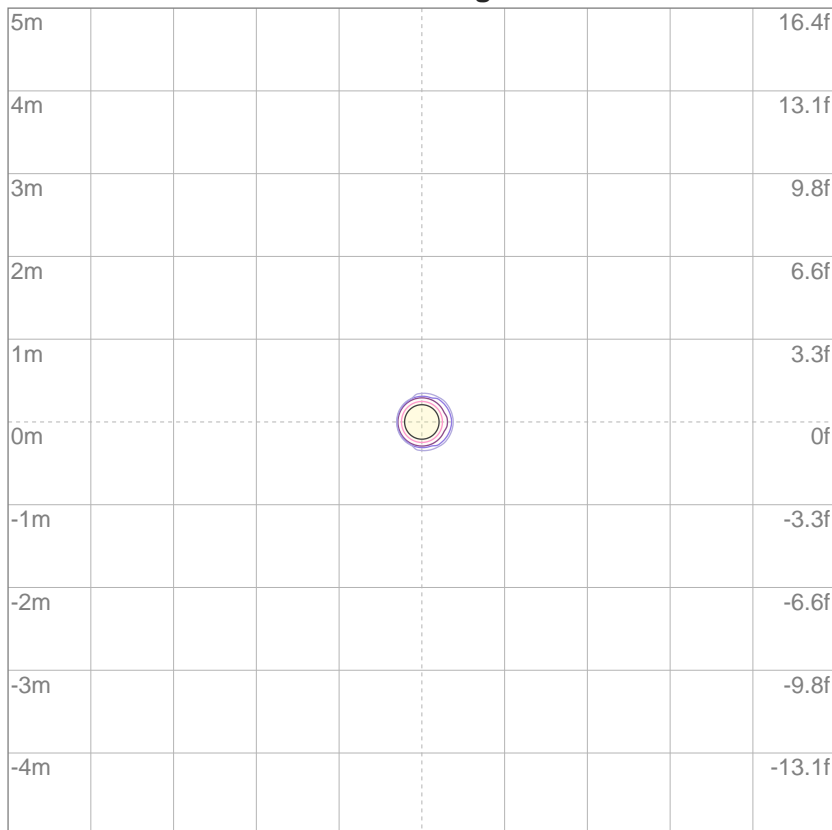
| | |
|-----|------------|
| 10% | 337771 cd |
| 20% | 675542 cd |
| 30% | 1013313 cd |
| 40% | 1351084 cd |
| 50% | 1688855 cd |
| 60% | 2026626 cd |
| 70% | 2364397 cd |
| 80% | 2702168 cd |
| 90% | 3039939 cd |

Conditions:

Number of c-planes: 2

Candela at center: 3377710 cd

ISO Lux Diagram



Mounting Height: 10 meters (33 feet)

| | |
|-----|----------|
| 3% | 1013 lx |
| 5% | 1689 lx |
| 10% | 3378 lx |
| 30% | 10.1K lx |
| 50% | 16.9K lx |

Conditions:

Number of c-planes: 2

Lux at center: 33.8K lx

Lux distribution on a surface when lamp is mounted at 10 meters from the surface.

Smarty Hybrid



Color Temperature:



Total Lumen Output:
4593 lm

Light Quality:

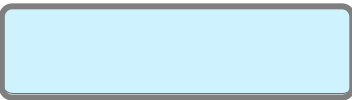


Peak:
45489 cd

Light Efficiency:



Power: 393 W



CIE 1931
x: 0.309
y: 0.319

Test: Spot Zoom Out

Date: 6/4/2018

Voltage: 116 V

Current: 3.39 A

Frequency: 60 Hz

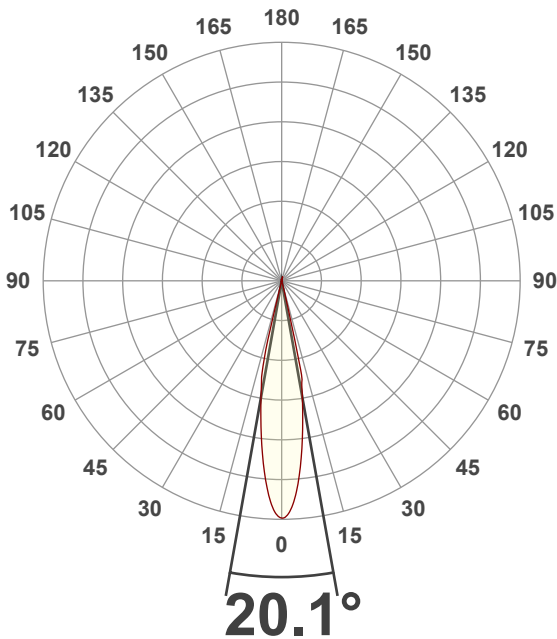
CRI: 77.7

CQS: 74.0

TM30: 77.4

Note:

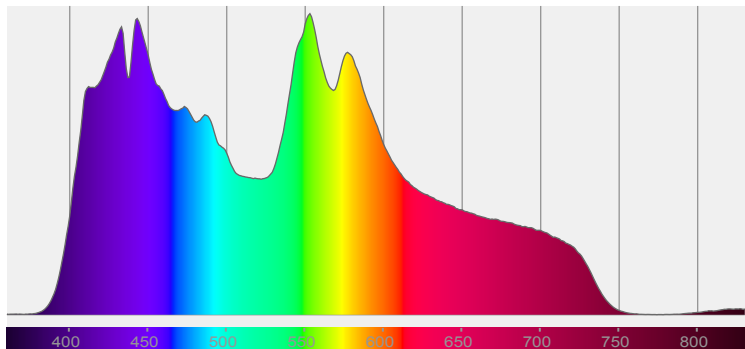
Beam Angle



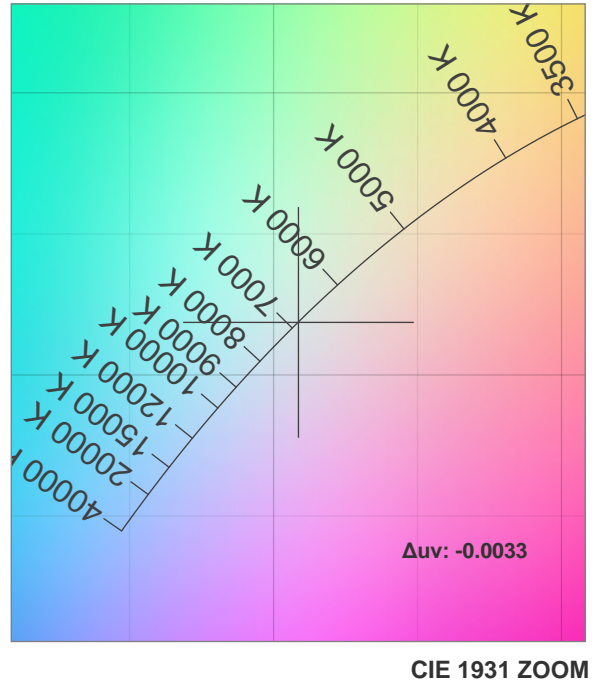
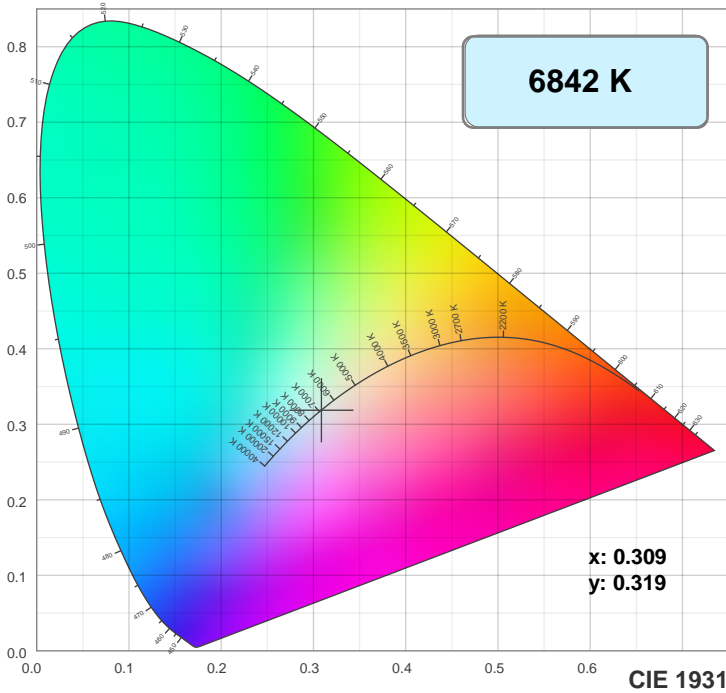
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2.5% |
|-------------------|--------------------|----------------------|
| 20.1° | 27.3° | 28.4° |

Spectra

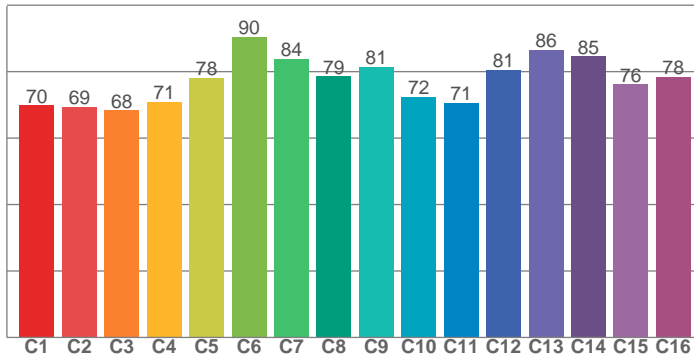
Dominant Wavelength: 360nm



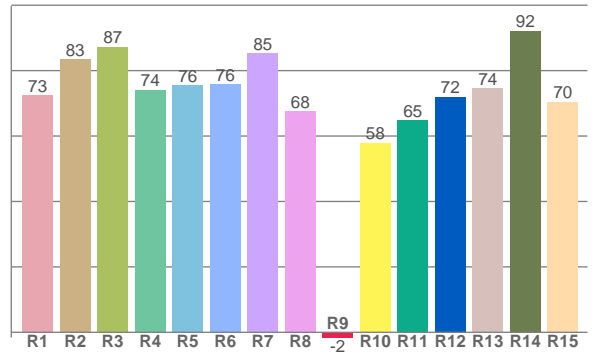
Color Details



TM30: 77.4



CRI: 77.7 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 72.5 | 83.5 | 87.3 | 74.1 | 75.5 | 75.8 | 85.4 | 67.6 | -1.6 | 57.9 | 64.9 | 72.0 | 74.5 | 92.2 | 70.5 |

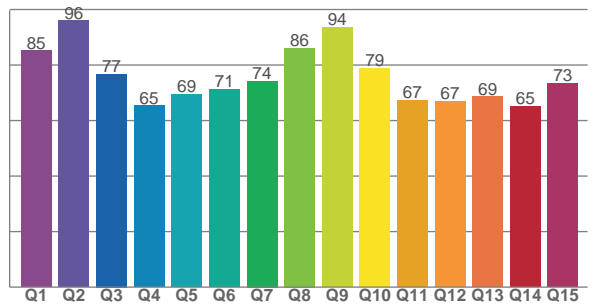
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 69.9 | 69.3 | 68.4 | 71.0 | 78.2 | 90.4 | 83.9 | 78.6 | 81.5 | 72.5 | 70.5 | 80.6 | 86.5 | 84.6 | 76.2 | 78.5 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85.3 | 96.0 | 76.8 | 65.3 | 69.5 | 71.2 | 74.2 | 86.1 | 93.6 | 78.8 | 67.3 | 67.0 | 68.7 | 65.1 | 73.4 |

CQS: 74.0



Color Parameters

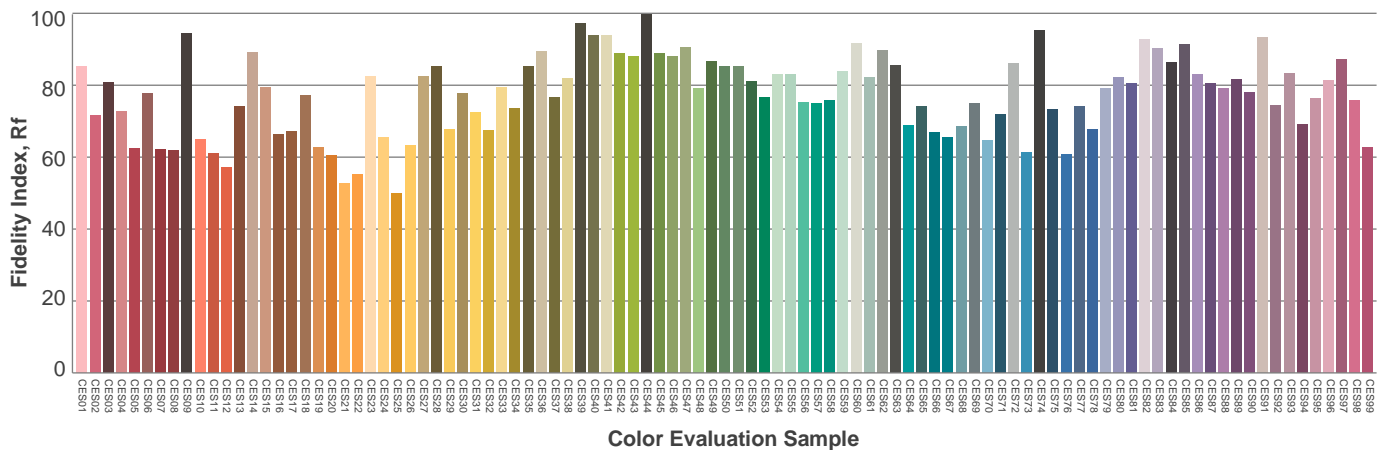
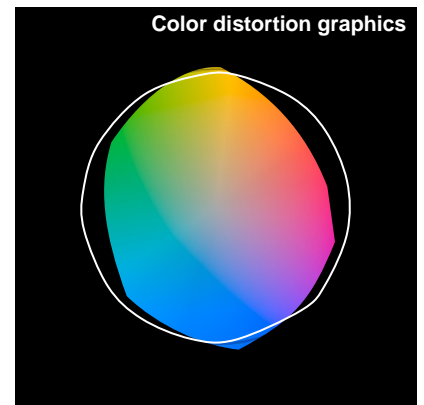
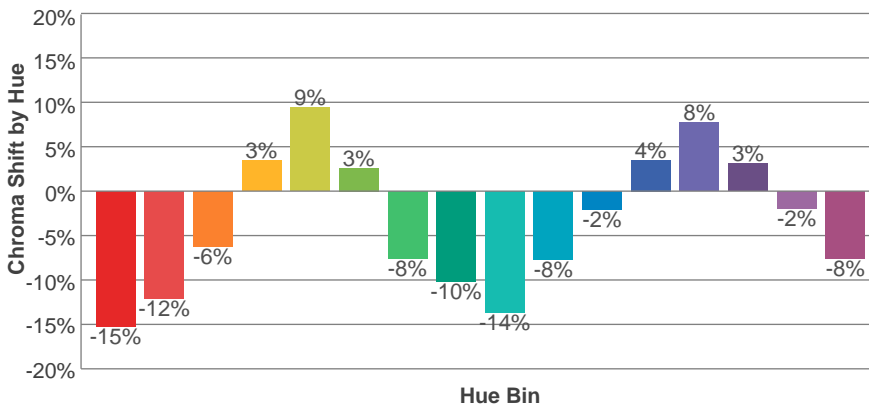
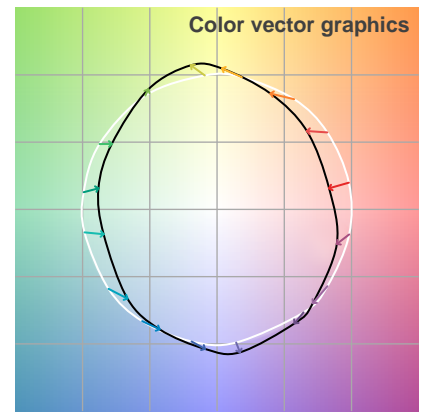
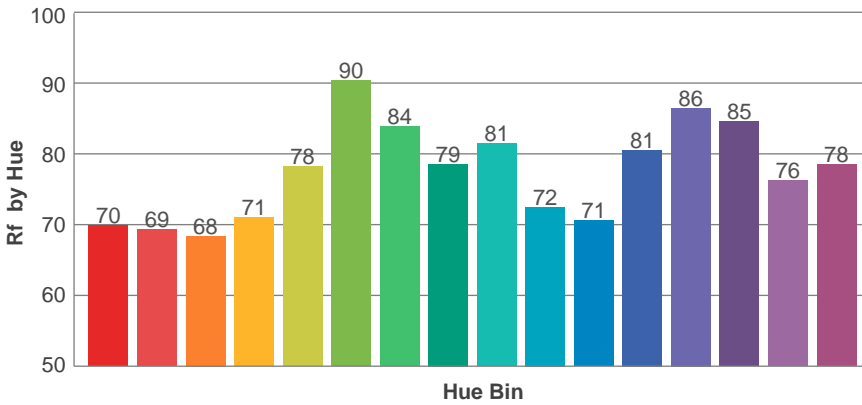
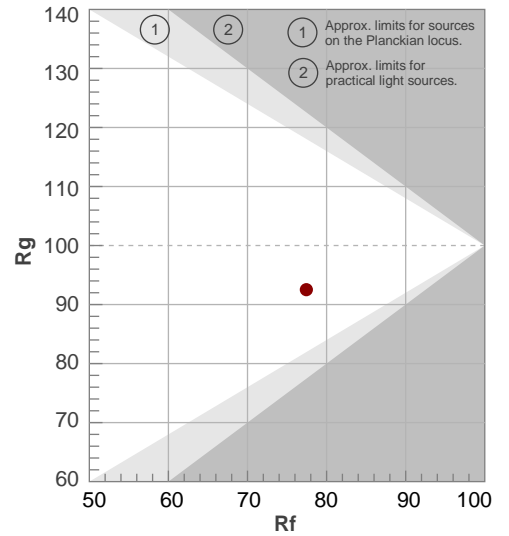
| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate | Color Coordinate | Color Deviation from Black Body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 6842 K | 77.7 | -1.6 | 77.4 | 92.5 | 74.0 | 0.309 | 0.319 | 0.199 | 0.308 | -0.0033 |

TM30 Details

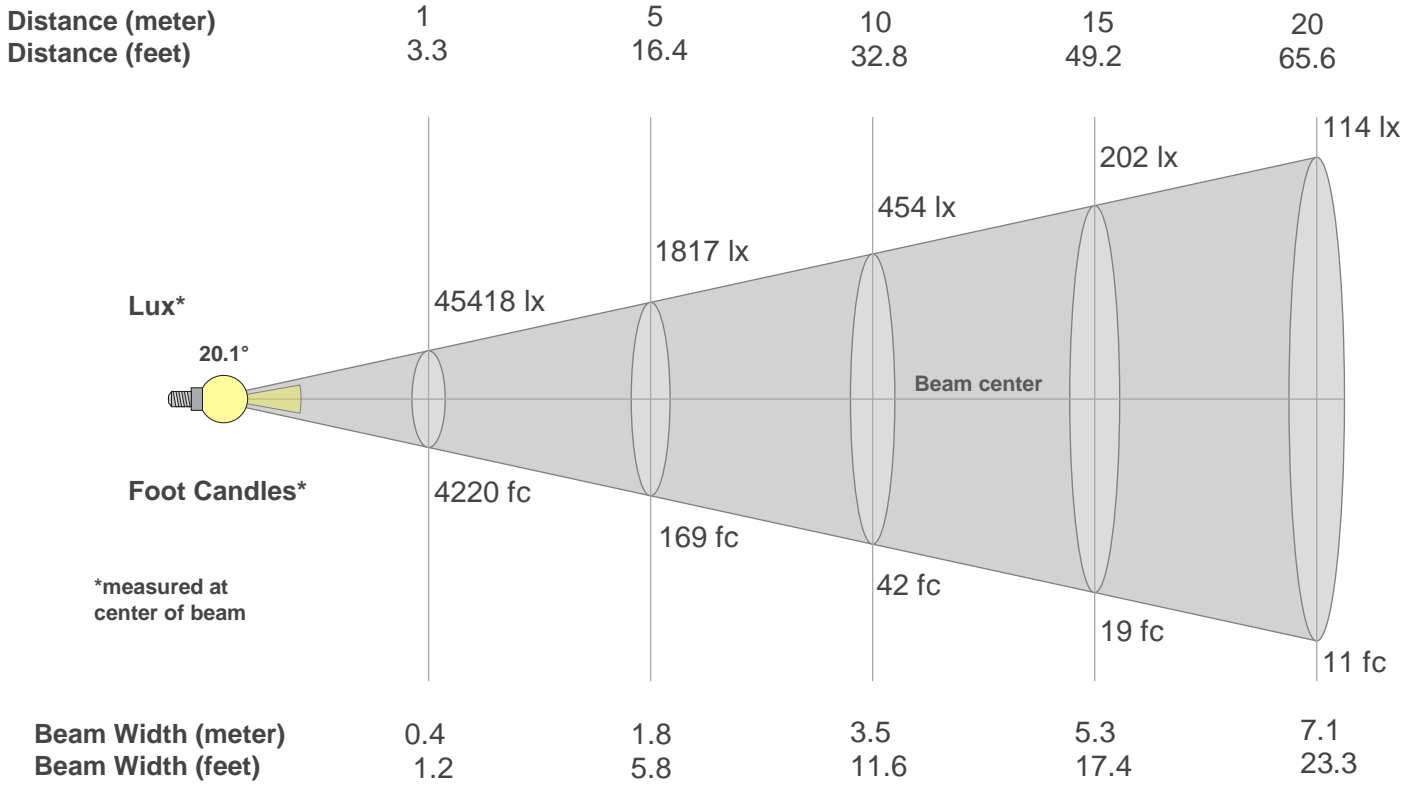
Rf 77.4
Fidelity Index Rf

Rg 92.5
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 70 | -15% | -1% |
| 2 | 69 | -12% | 9% |
| 3 | 68 | -6% | 17% |
| 4 | 71 | 3% | 16% |
| 5 | 78 | 9% | 9% |
| 6 | 90 | 3% | -4% |
| 7 | 84 | -8% | -5% |
| 8 | 79 | -10% | -5% |
| 9 | 81 | -14% | 4% |
| 10 | 72 | -8% | 14% |
| 11 | 71 | -2% | 14% |
| 12 | 81 | 4% | 11% |
| 13 | 86 | 8% | 1% |
| 14 | 85 | 3% | -10% |
| 15 | 76 | -2% | -17% |
| 16 | 78 | -8% | -9% |



Beam Details



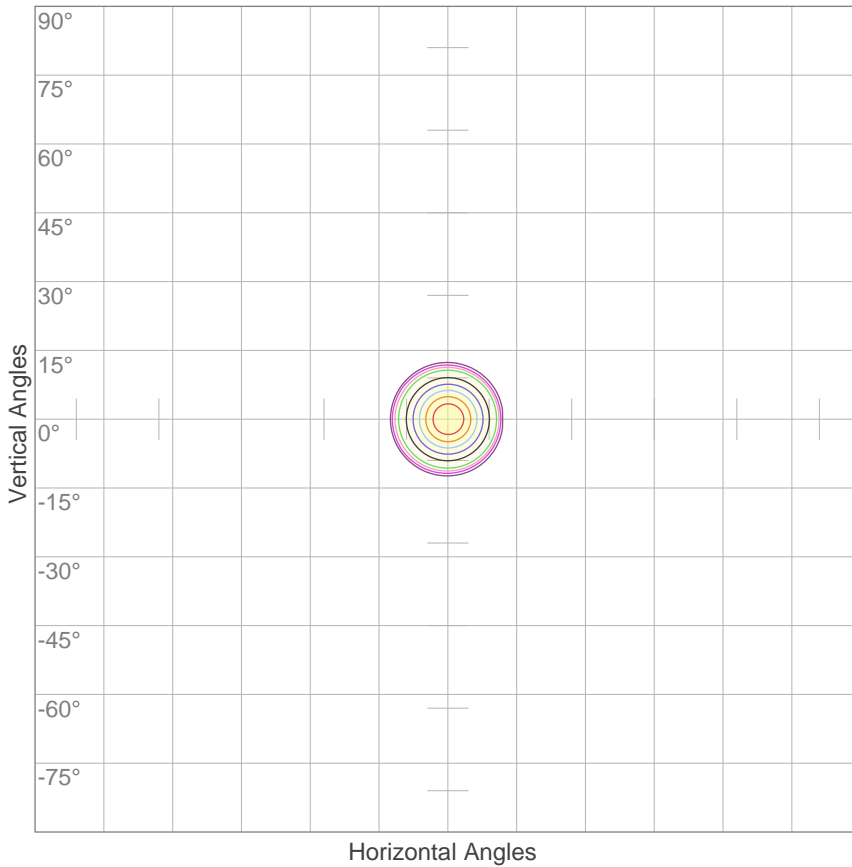
Beam Intensities from 1-20m

| 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 | 45418 | 11355 | 5046 | 2839 | 1817 | 1262 | 927 | 710 | 561 | 454 | 375 | 315 | 269 | 232 | 202 | 177 | 157 | 140 | 126 | 114 |
| fc | 4219.5 | 1054.9 | 468.8 | 263.7 | 168.8 | 117.2 | 86.1 | 65.9 | 52.1 | 42.2 | 34.9 | 29.3 | 25 | 21.5 | 18.8 | 16.5 | 14.6 | 13 | 11.7 | 10.5 |

| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2,5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 20.1° | 27.3° | 28.4° | 99.1% | 98.8% |

ISO Diagrams

ISO Candela Diagram



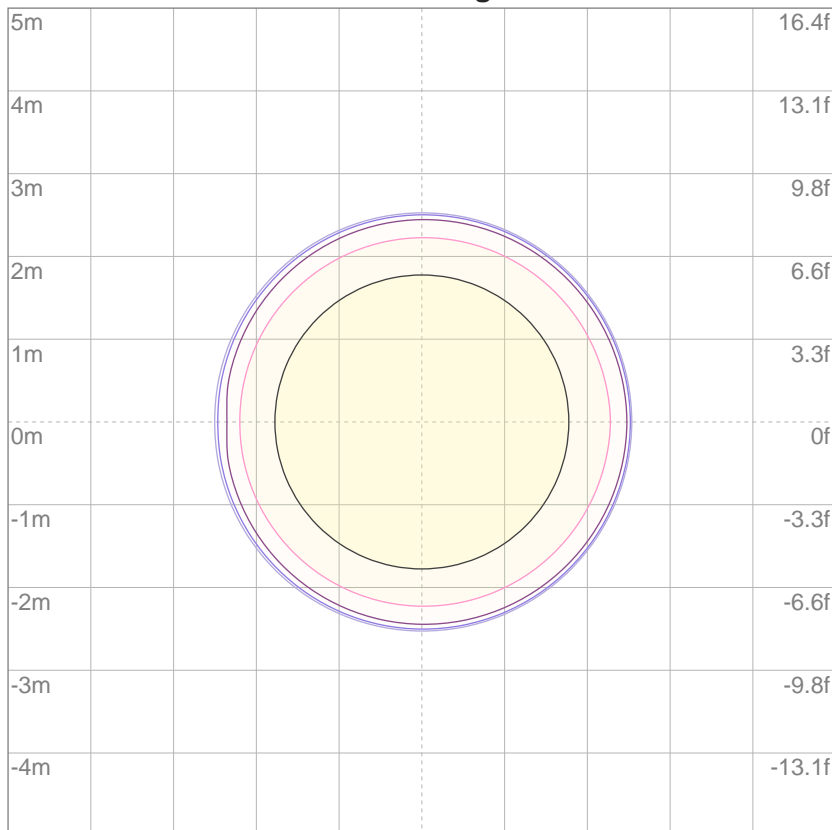
| | |
|-----|----------|
| 10% | 4542 cd |
| 20% | 9084 cd |
| 30% | 13626 cd |
| 40% | 18167 cd |
| 50% | 22709 cd |
| 60% | 27251 cd |
| 70% | 31793 cd |
| 80% | 36335 cd |
| 90% | 40877 cd |

Conditions:

Number of c-planes: 2

Candela at center: 45418 cd

ISO Lux Diagram



Mounting Height: 10 meters (33 feet)

| | |
|-----|---------|
| 3% | 13.6 lx |
| 5% | 22.7 lx |
| 10% | 45.4 lx |
| 30% | 136 lx |
| 50% | 227 lx |

Conditions:

Number of c-planes: 2

Lux at center: 454 lx

Lux distribution on a surface when lamp is mounted at 10 meters from the surface.

Smarty Hybrid



Color Temperature:



Total Lumen Output:
8057 lm

Light Quality:

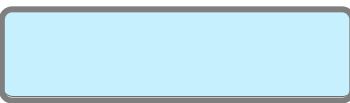


Peak:
3477407 cd

Light Efficiency:



Power: 393 W



CIE 1931
x: 0.305
y: 0.314

Test: Frost Zoom In

Date: 6/4/2018

Voltage: 116 V

Current: 3.40 A

Frequency: 60 Hz

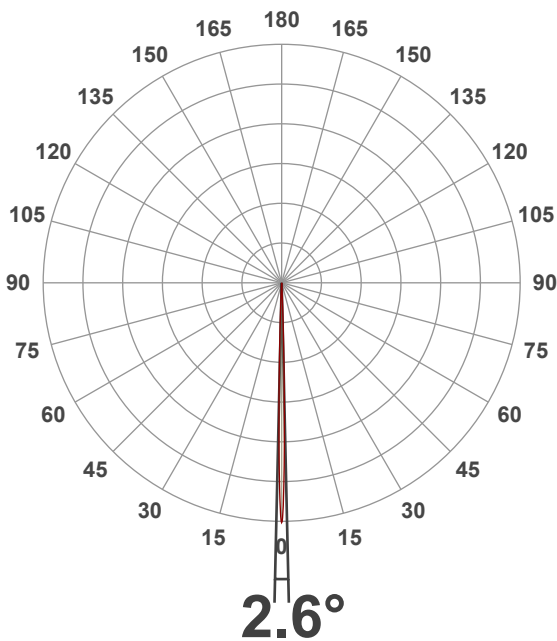
CRI: 78.3

CQS: 74.2

TM30: 77.9

Note:

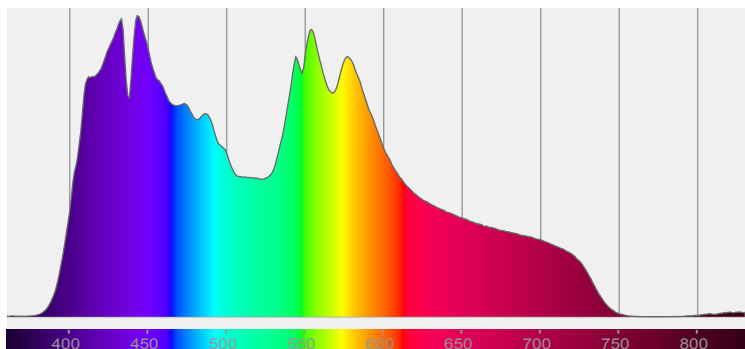
Beam Angle



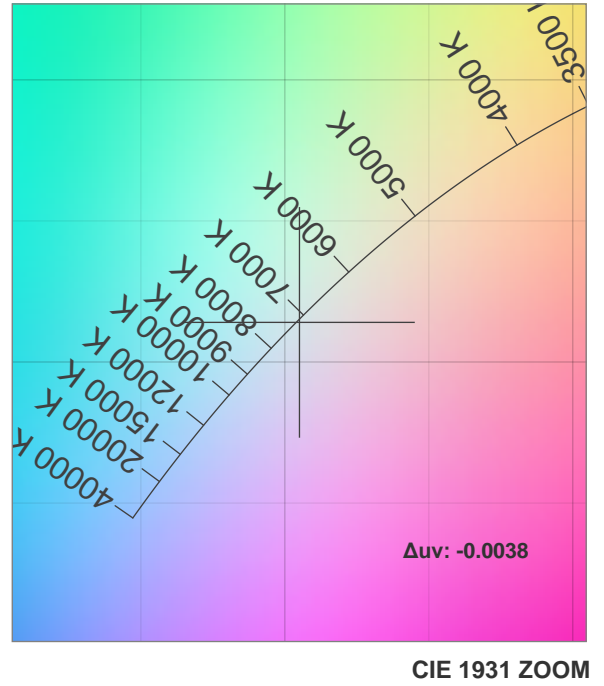
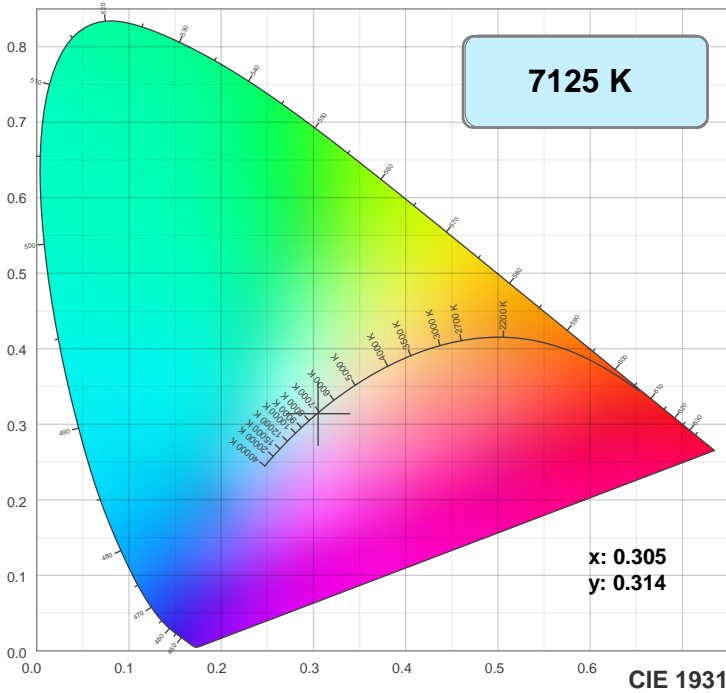
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2.5% |
|-------------------|--------------------|----------------------|
| 2.6° | 4.8° | 6° |

Spectra

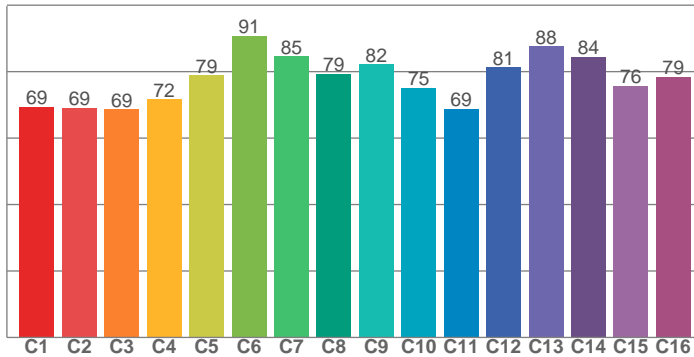
Dominant Wavelength: 452nm



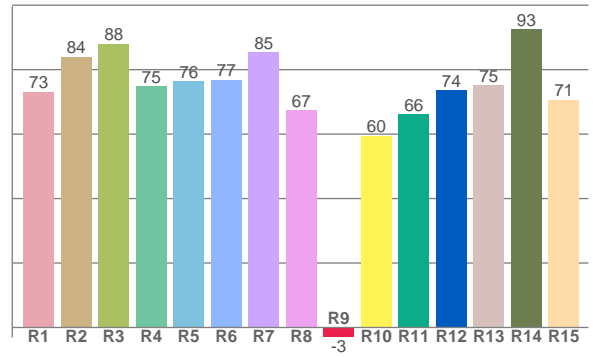
Color Details



TM30: 77.9



CRI: 78.3 (R1-R8)



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

| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 73.2 | 84.1 | 88.0 | 74.8 | 76.4 | 76.9 | 85.4 | 67.4 | -3.1 | 59.6 | 66.2 | 73.7 | 75.2 | 92.6 | 70.6 |

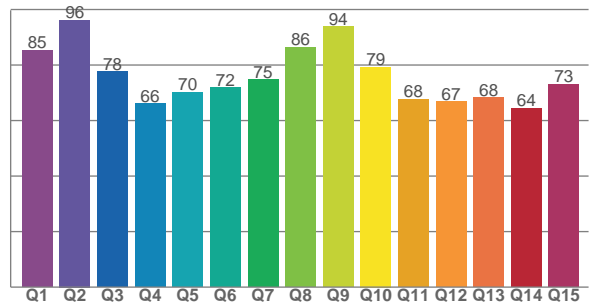
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 69.5 | 69.2 | 68.6 | 71.7 | 78.9 | 90.8 | 84.7 | 79.4 | 82.1 | 75.2 | 68.7 | 81.3 | 87.6 | 84.4 | 75.7 | 78.5 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85.3 | 96.2 | 77.6 | 66.2 | 70.2 | 71.9 | 74.8 | 86.4 | 93.9 | 79.3 | 67.7 | 66.7 | 68.2 | 64.5 | 73.1 |

CQS: 74.2



Color Parameters

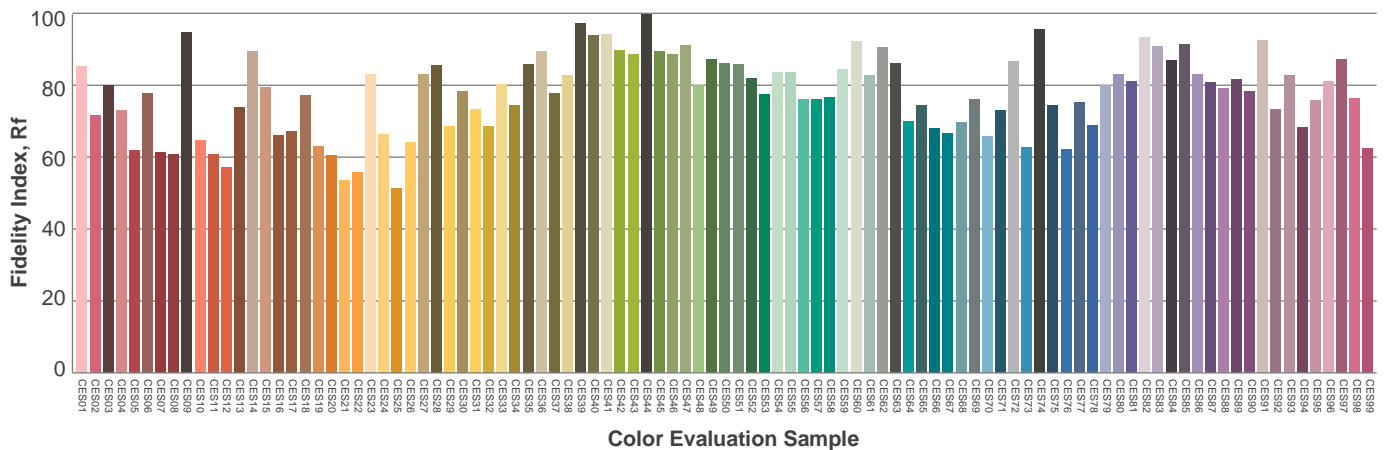
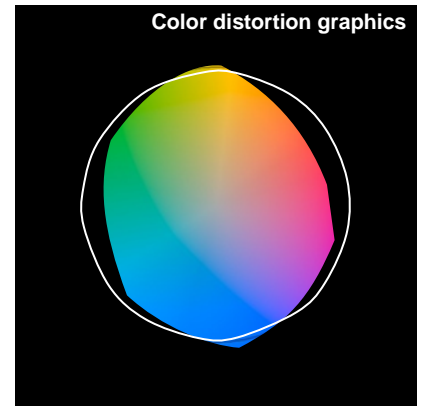
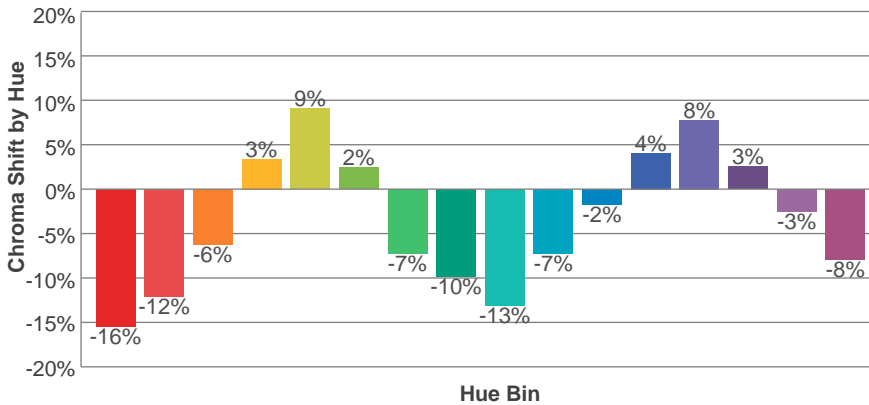
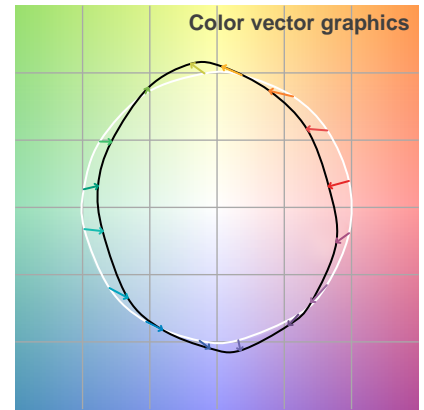
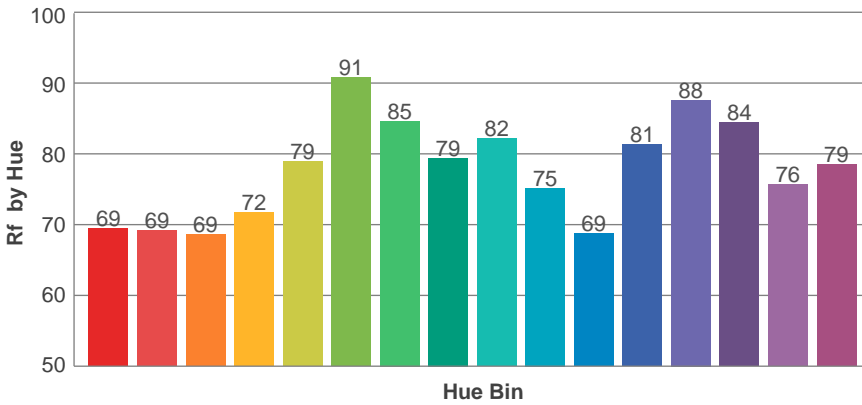
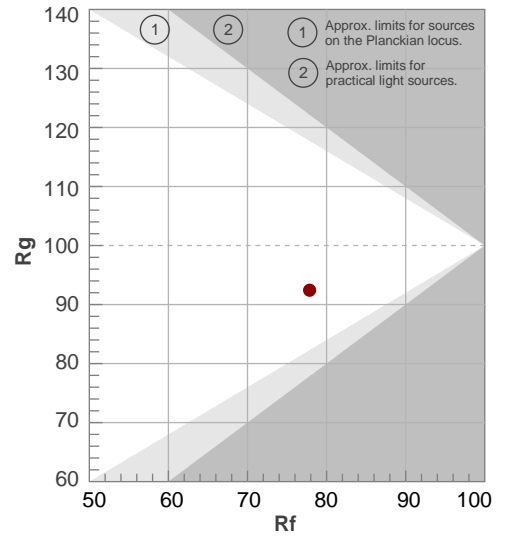
| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate | Color Coordinate | Color Deviation from Black Body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 7125 K | 78.3 | -3.1 | 77.9 | 92.4 | 74.2 | 0.305 | 0.314 | 0.198 | 0.306 | -0.0038 |

TM30 Details

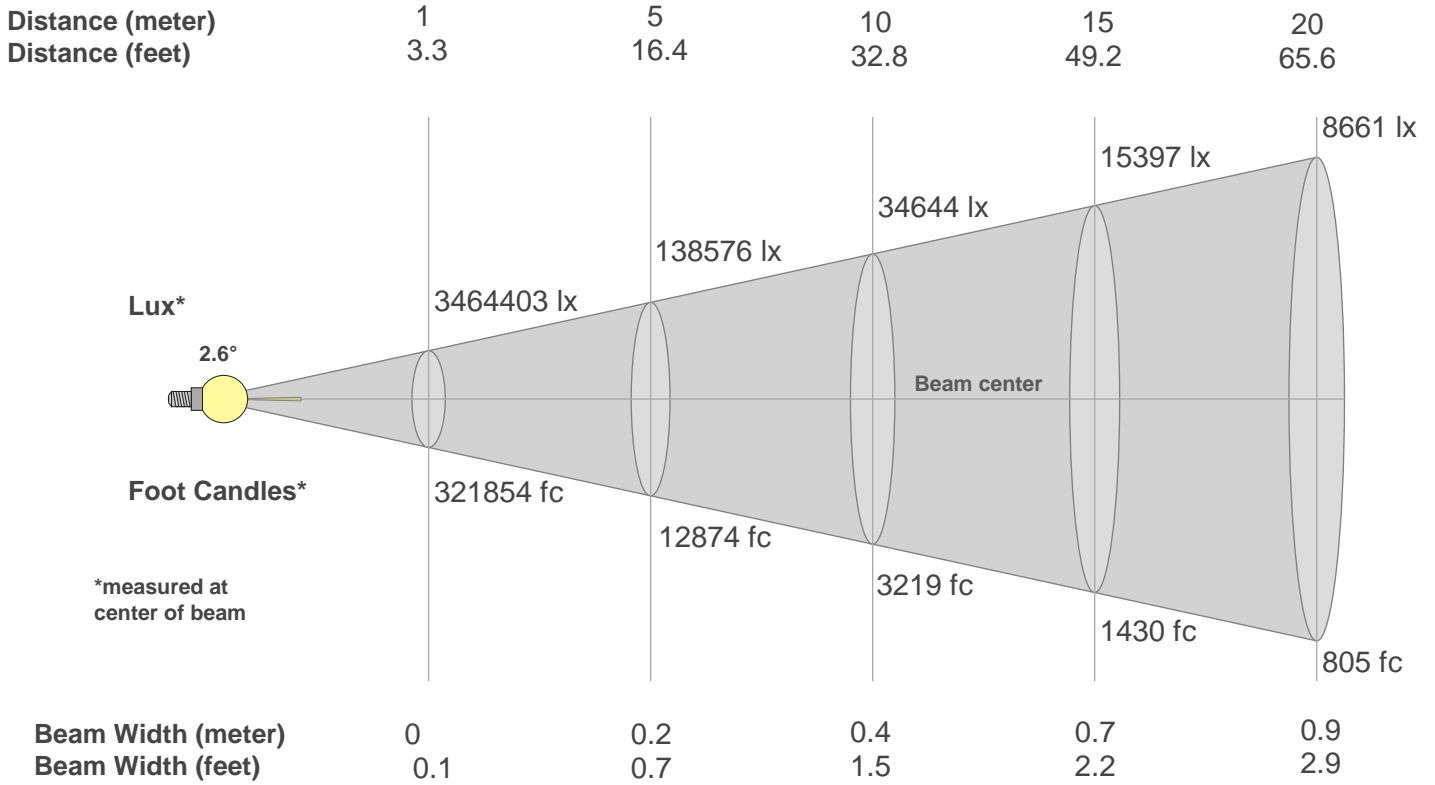
Rf 77.9
Fidelity Index Rf

Rg 92.4
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 69 | -16% | -1% |
| 2 | 69 | -12% | 10% |
| 3 | 69 | -6% | 17% |
| 4 | 72 | 3% | 15% |
| 5 | 79 | 9% | 8% |
| 6 | 91 | 2% | -4% |
| 7 | 85 | -7% | -5% |
| 8 | 79 | -10% | -5% |
| 9 | 82 | -13% | 4% |
| 10 | 75 | -7% | 14% |
| 11 | 69 | -2% | 13% |
| 12 | 81 | 4% | 8% |
| 13 | 88 | 8% | 0% |
| 14 | 84 | 3% | -10% |
| 15 | 76 | -3% | -17% |
| 16 | 79 | -8% | -8% |



Beam Details



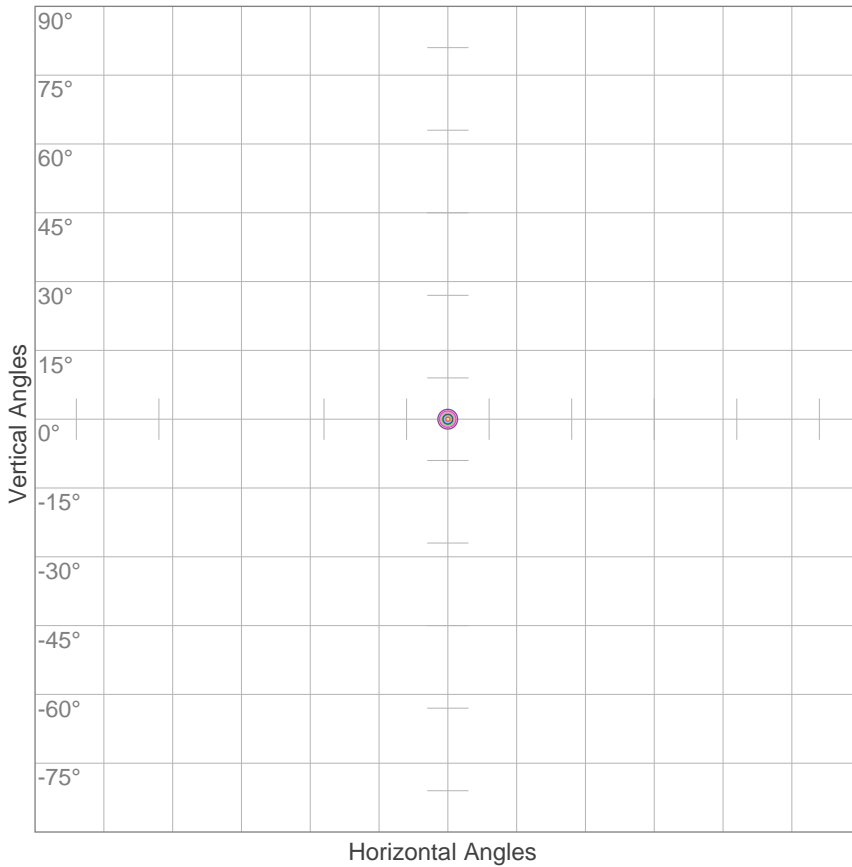
Beam Intensities from 1-20m

| | | | | | | | | | | | | | | | | | | | | |
|----|----------|---------|---------|---------|---------|--------|--------|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-------|-------|-------|
| 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 | 3464403 | 866101 | 384934 | 216525 | 138576 | 96233 | 70702 | 54131 | 42770 | 34644 | 28631 | 24058 | 20499 | 17676 | 15397 | 13533 | 11988 | 10693 | 9597 | 8661 |
| fc | 321853.6 | 80463.4 | 35761.5 | 20115.9 | 12874.1 | 8940.4 | 6568.4 | 5029 | 3973.5 | 3218.5 | 2659.9 | 2235.1 | 1904.5 | 1642.1 | 1430.5 | 1257.2 | 1113.7 | 993.4 | 891.6 | 804.6 |

| | | | | |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2,5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
| 2.6° | 4.8° | 6° | 100.0% | 100.0% |

ISO Diagrams

ISO Candela Diagram



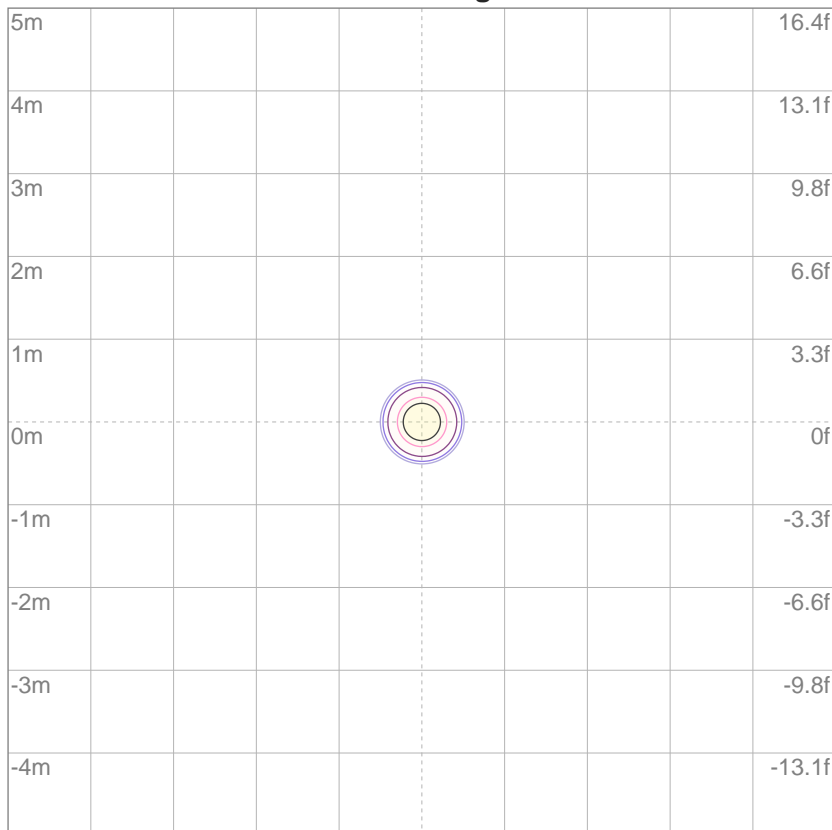
| | |
|-----|------------|
| 10% | 346440 cd |
| 20% | 692881 cd |
| 30% | 1039321 cd |
| 40% | 1385761 cd |
| 50% | 1732202 cd |
| 60% | 2078642 cd |
| 70% | 2425082 cd |
| 80% | 2771523 cd |
| 90% | 3117963 cd |

Conditions:

Number of c-planes: 2

Candela at center: 3464403 cd

ISO Lux Diagram



Mounting Height: 10 meters (33 feet)

| | |
|-----|----------|
| 3% | 1039 lx |
| 5% | 1732 lx |
| 10% | 3464 lx |
| 30% | 10.4K lx |
| 50% | 17.3K lx |

Conditions:

Number of c-planes: 2

Lux at center: 34.6K lx

Lux distribution on a surface when lamp is mounted at 10 meters from the surface.

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Color Temperature:



Total Lumen Output:
8587 lm

Light Quality:

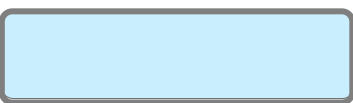


Peak:
74896 cd

Light Efficiency:



Power: 393 W



CIE 1931
x: 0.305
y: 0.313

Test: Frost Zoom Out

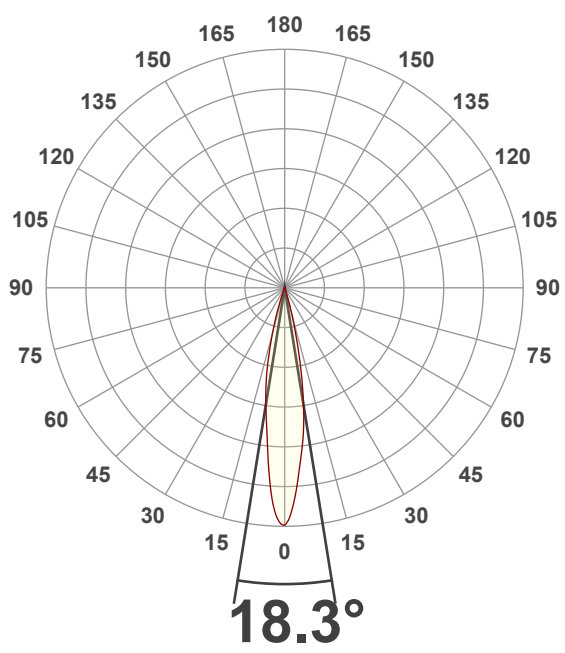
Date: 6/4/2018

Voltage: 116 V
Current: 3.40 A
Frequency: 60 Hz

CRI: 77.9
CQS: 73.7
TM30: 77.4

Note:

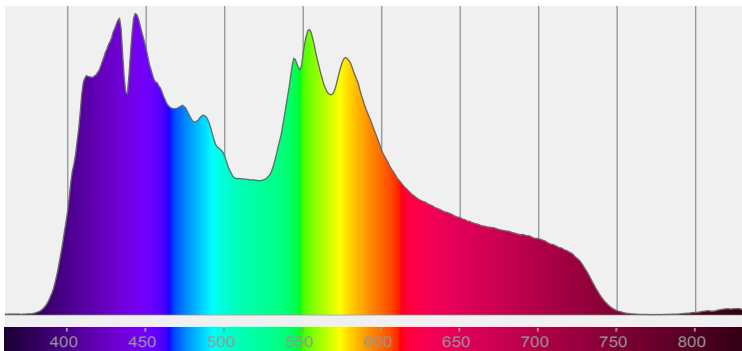
Beam Angle



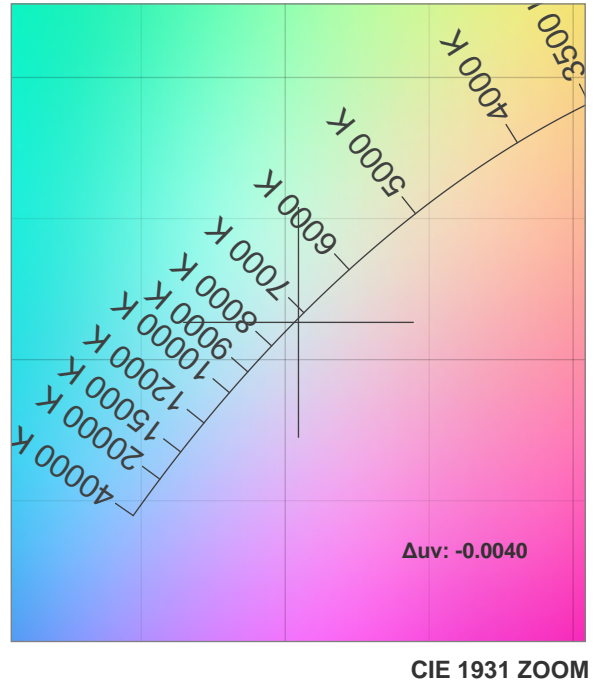
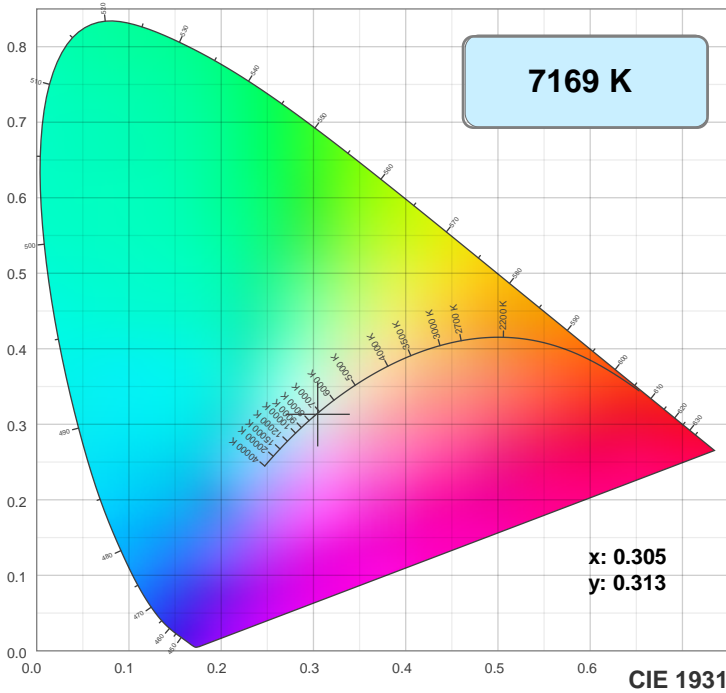
| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2.5% |
|-------------------|--------------------|----------------------|
| 18.3° | 32.9° | 39.3° |

Spectra

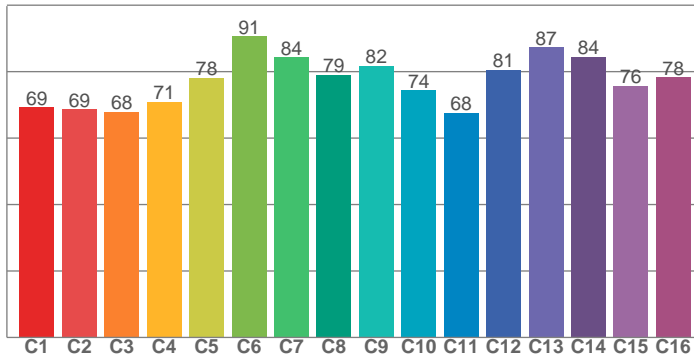
Dominant Wavelength: 452nm



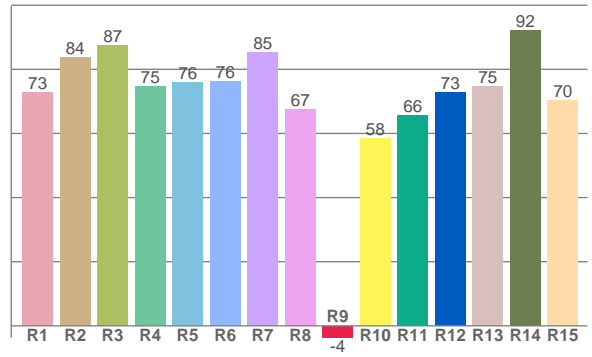
Color Details



TM30: 77.4



CRI: 77.9 (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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 72.8 | 83.7 | 87.5 | 74.5 | 76.0 | 76.3 | 85.2 | 67.4 | -3.6 | 58.4 | 65.6 | 72.9 | 74.8 | 92.3 | 70.4 |

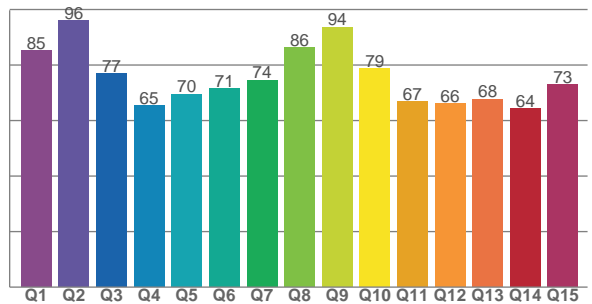
TM30 C Values, 16 binned values out of total of 99 C values

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 69.2 | 68.7 | 68.0 | 70.8 | 78.2 | 90.6 | 84.3 | 79.0 | 81.7 | 74.4 | 67.6 | 80.5 | 87.3 | 84.4 | 75.7 | 78.3 |

CQS Q Values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 85.3 | 96.0 | 77.0 | 65.3 | 69.5 | 71.4 | 74.5 | 86.3 | 93.6 | 78.7 | 66.9 | 66.0 | 67.7 | 64.2 | 73.0 |

CQS: 73.7



Color Parameters

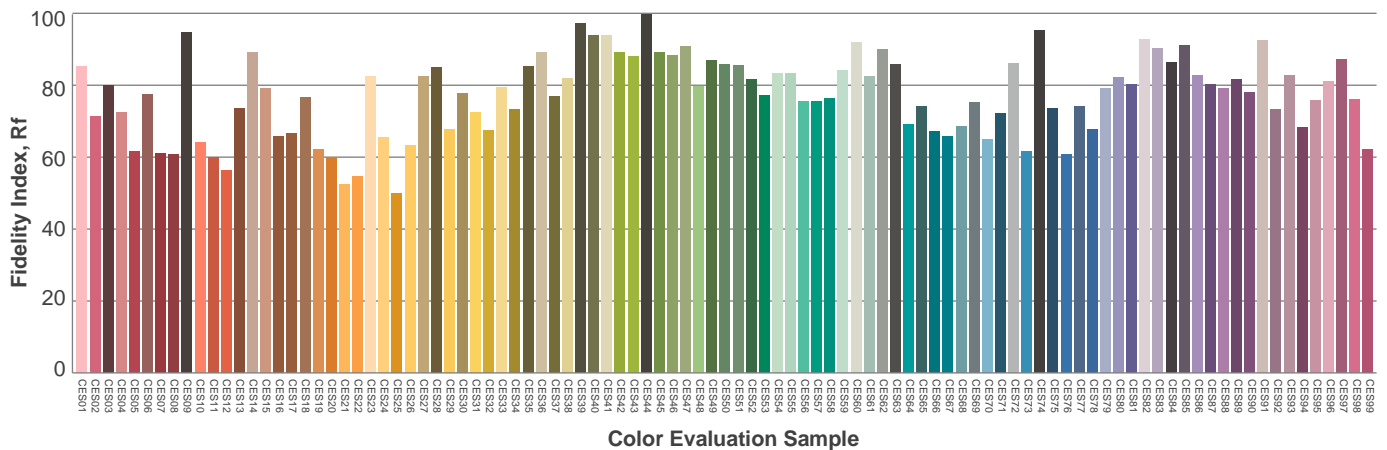
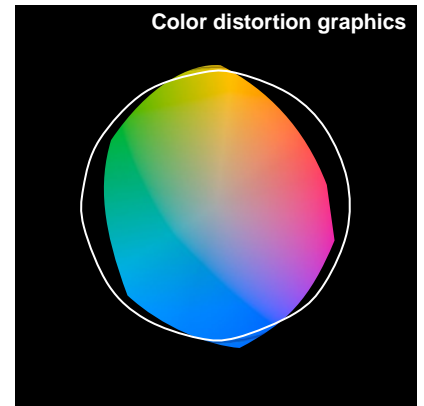
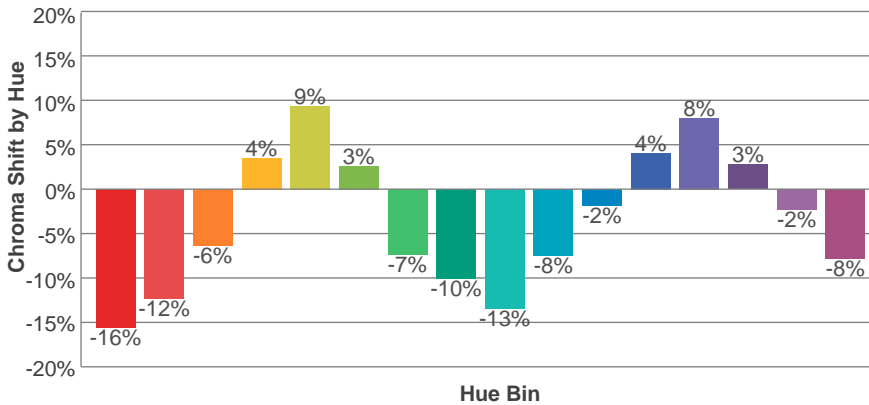
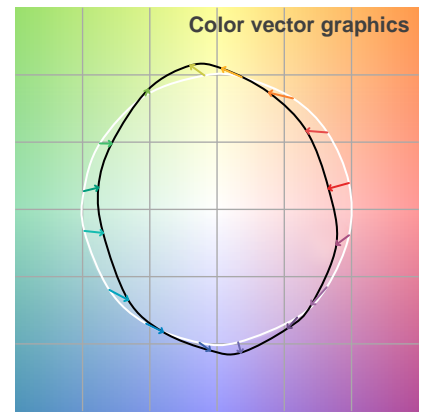
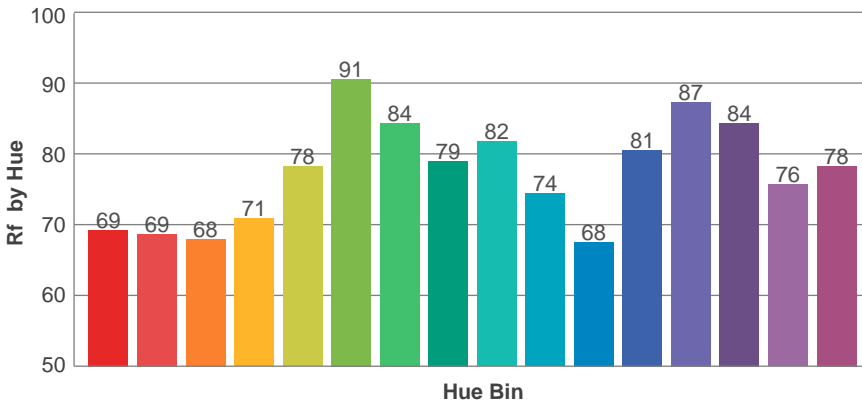
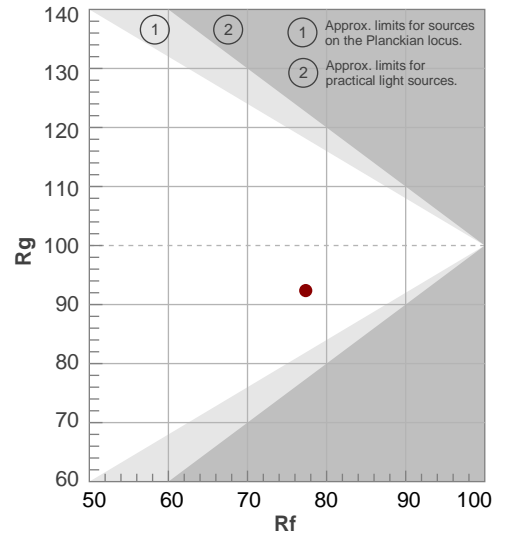
| Color Temperature | Color Rendering Index | Red Component | Color Fidelity | Color Gamut | Color Quality Scale | Color Coordinate CIE 1931 | Color Coordinate CIE 1931 | Color Coordinate | Color Coordinate | Color Deviation from Black Body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 7169 K | 77.9 | -3.6 | 77.4 | 92.4 | 73.7 | 0.305 | 0.313 | 0.198 | 0.306 | -0.0040 |

TM30 Details

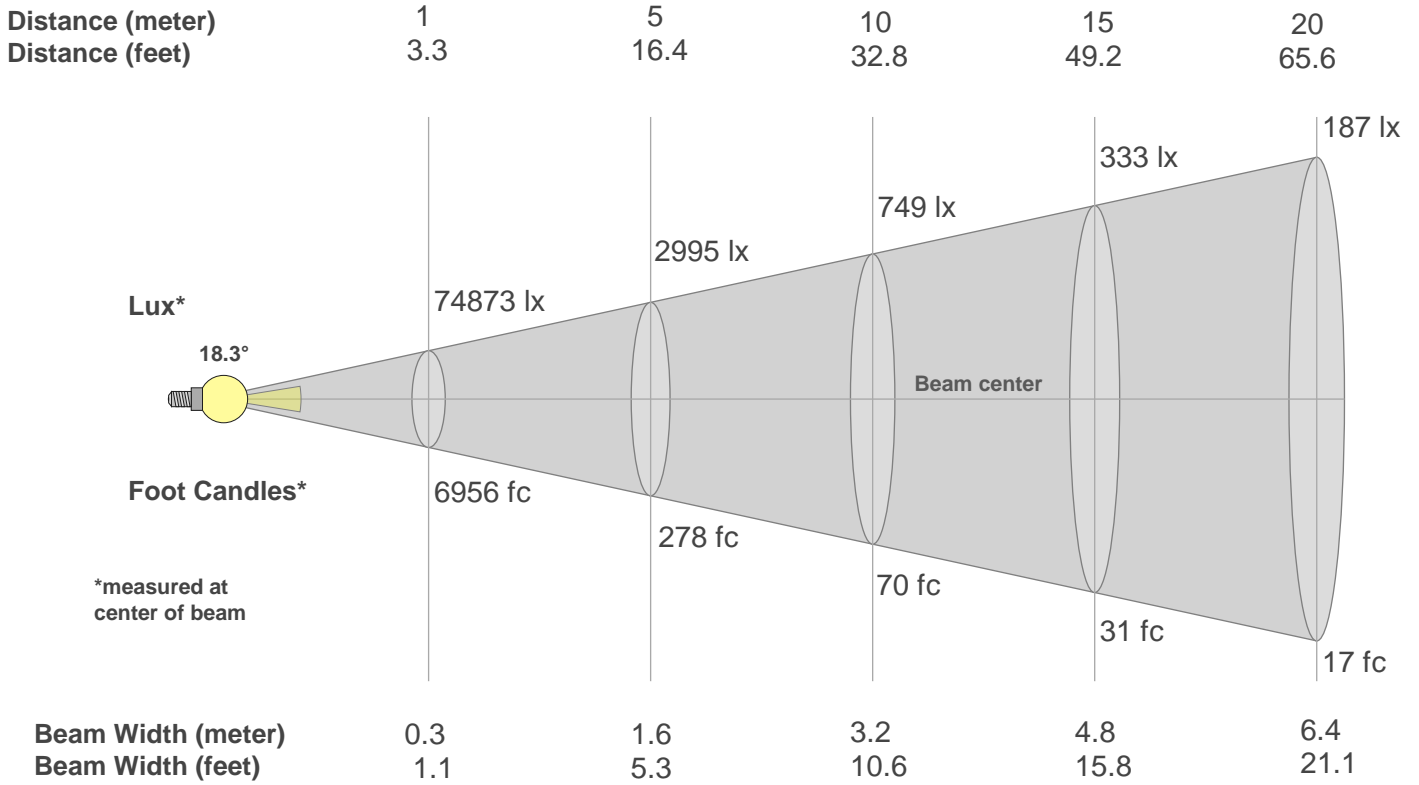
Rf 77.4
Fidelity Index Rf

Rg 92.4
Gamut Index Rg

| Hue Bin | R _f | Graphic shifts (%) | |
|---------|----------------|--------------------|------|
| | | Chroma | Hue |
| 1 | 69 | -16% | -1% |
| 2 | 69 | -12% | 10% |
| 3 | 68 | -6% | 17% |
| 4 | 71 | 4% | 16% |
| 5 | 78 | 9% | 9% |
| 6 | 91 | 3% | -4% |
| 7 | 84 | -7% | -5% |
| 8 | 79 | -10% | -5% |
| 9 | 82 | -13% | 4% |
| 10 | 74 | -8% | 14% |
| 11 | 68 | -2% | 14% |
| 12 | 81 | 4% | 9% |
| 13 | 87 | 8% | 0% |
| 14 | 84 | 3% | -10% |
| 15 | 76 | -2% | -17% |
| 16 | 78 | -8% | -9% |



Beam Details



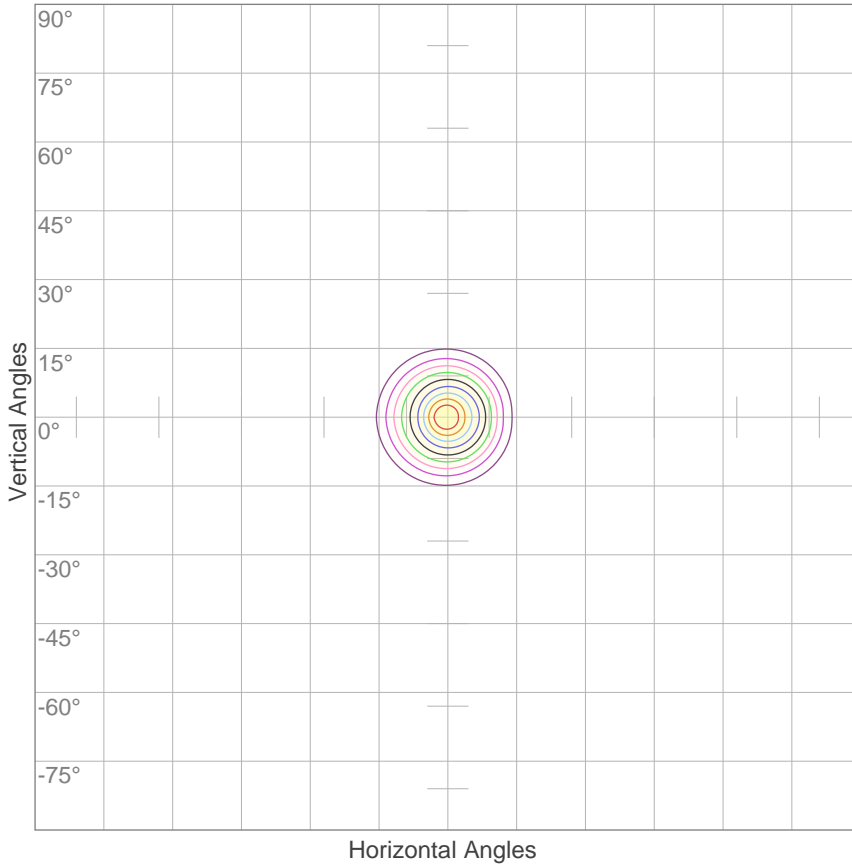
Beam Intensities from 1-20m

| 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 | 74873 | 18718 | 8319 | 4680 | 2995 | 2080 | 1528 | 1170 | 924 | 749 | 619 | 520 | 443 | 382 | 333 | 292 | 259 | 231 | 207 | 187 |
| fc | 6955.9 | 1739 | 772.9 | 434.7 | 278.2 | 193.2 | 142 | 108.7 | 85.9 | 69.6 | 57.5 | 48.3 | 41.2 | 35.5 | 30.9 | 27.2 | 24.1 | 21.5 | 19.3 | 17.4 |

| Beam Angle 50% | Field Angle 10% | Cutoff Angle 2,5% | Intensity Ratio in 120° Cone | Intensity Ratio in 90° Cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 18.3° | 32.9° | 39.3° | 98.7% | 98.2% |

ISO Diagrams

ISO Candela Diagram



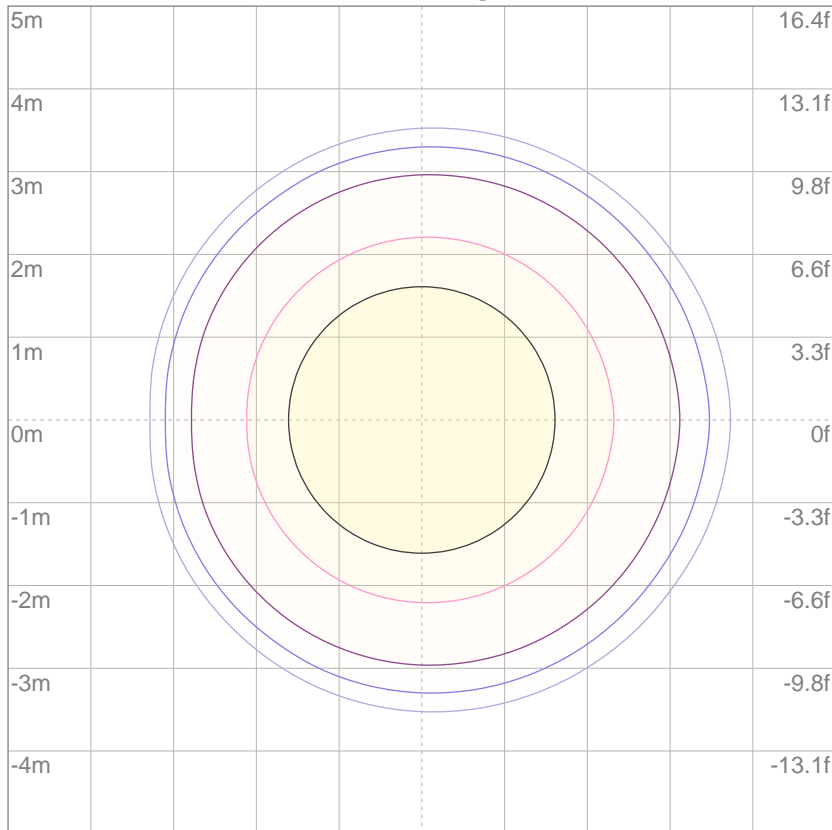
| | |
|-----|----------|
| 10% | 7487 cd |
| 20% | 14975 cd |
| 30% | 22462 cd |
| 40% | 29949 cd |
| 50% | 37436 cd |
| 60% | 44924 cd |
| 70% | 52411 cd |
| 80% | 59898 cd |
| 90% | 67385 cd |

Conditions:

Number of c-planes: 2

Candela at center: 74873 cd

ISO Lux Diagram



Mounting Height: 10 meters (33 feet)

| | |
|-----|---------|
| 3% | 22.5 lx |
| 5% | 37.4 lx |
| 10% | 74.9 lx |
| 30% | 225 lx |
| 50% | 374 lx |

Conditions:

Number of c-planes: 2

Lux at center: 749 lx

Lux distribution on a surface when lamp is mounted at 10 meters from the surface.