



## KL CYC S

Photometric &  
Chromaticity Test Reports



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# Testing Process

## Total Lumen Measurements

Lumens are measured using a Viso Systems Lab Spion. As a goniophotometer, the Viso calculates the field lumens of the fixture by taking multiple measurements across the light beam.

Many lumens figures provided for entertainment lighting fixtures are only  $2\pi$  sphere values, some even emphasize the LED engine lumens. All Elation product photometric data is the actual light output from the fixture lens, never a theoretical value based on calculation or using the source lumens as the fixtures output. We advise to always compare total fixture lumens acquired with identical measurement systems when comparing lighting fixtures.

## Test Lab Equipment and Process

Elation operates an optical testing laboratory at its Los Angeles, CA headquarters to provide accurate photometric data for its lighting products. The testing lab is both light and climate- controlled and contains a variety of precise lighting measurement systems. Fixtures are analyzed with the sophisticated [Viso Systems Lab Spion](#) equipment, which measures all light and color parameters by panning the light beam at a precise speed and from different angles through a calibrated, laser aligned light and color sensor. Test data is collected and summarized by the Viso Light Inspector software. This type of measurement system is referred to as a Goniophotometer.

The Viso software calculates all relevant types of measurements, from beam angles, candela to center light intensity at a variety of distances to the latest color quality measurements like TM30 or CQS as well as accurate color temperature. This wealth of data is then processed by an Elation specific template which is included in the photometric test report for various fixture conditions such as zoom angles and color correction filters.

The Viso software also creates IES (Illuminating Engineering Society) files for each test report. IES is an industry standard file format created for the easy electronic transfer of photometric test data, which is widely used by lighting manufacturers for photometric data distribution.

Additionally, fixtures are periodically rechecked for accuracy using various hand-held light meters including one or more of the devices listed below. This is done to ensure the test data contained in this report is as accurate as possible.

[Asenstek Lighting Passport](#) | [Konica Minolta T-10](#) | [Sekonic C800U](#)

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### Key Measurements

#### Output

Total Lumen Output: 4681 lm  
Peak Intensity: 3757 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

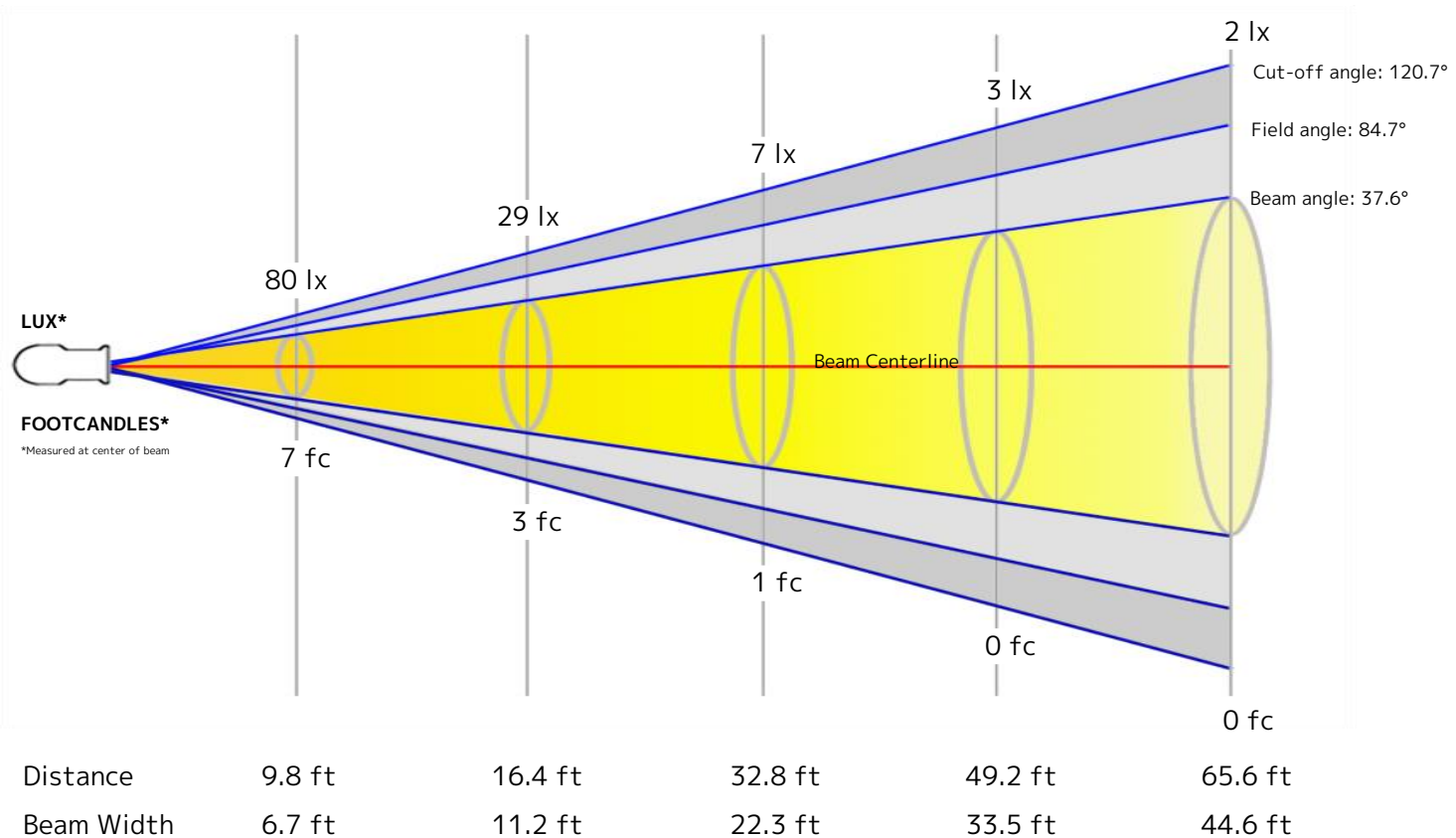
Color Temperature: 5876 K  
CRI: 93.6  
TLCI: 87  
TM30 R<sub>F</sub>: 92.5  
TM30 R<sub>G</sub>: 103.7

#### Power Details

Efficacy: 49 Lumen/Watt  
Power: 94.6 W  
Supply Voltage: 120 V  
Current: 0.794 A

### Beam Details

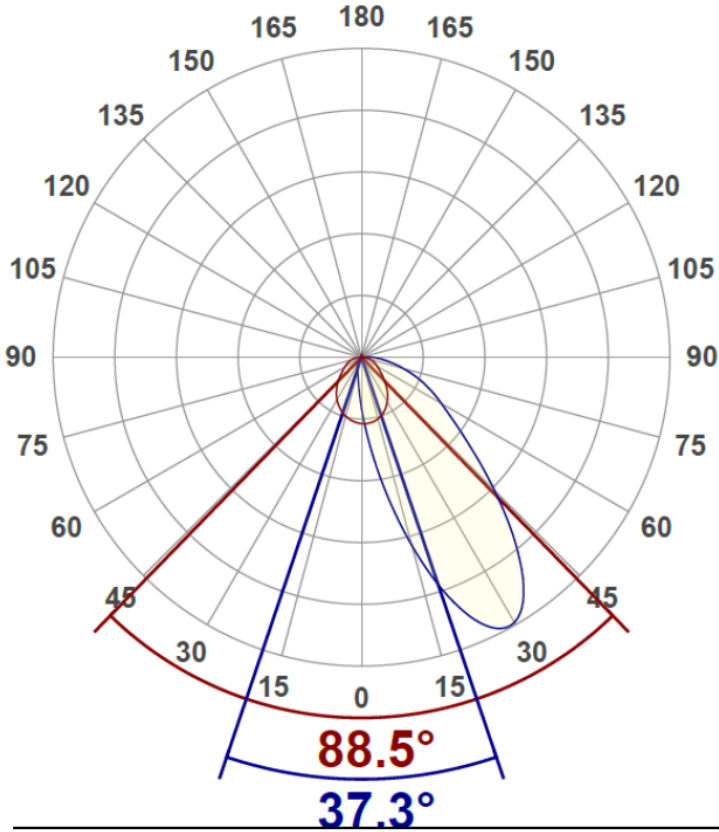
| Distance   | 3 m | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-----|-------|-------|--------|--------|
| Beam Width | m   | 3.4 m | 6.8 m | 10.2 m | 13.6 m |



### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 724  | 181  | 80  | 45   | 29   | 20   | 15  | 11   | 9    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 3    | 2    | 2    | 2    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 67.3 | 16.8 | 7.5 | 4.2  | 2.7  | 1.9  | 1.4 | 1.1  | 0.8  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  |

### Angular Distribution



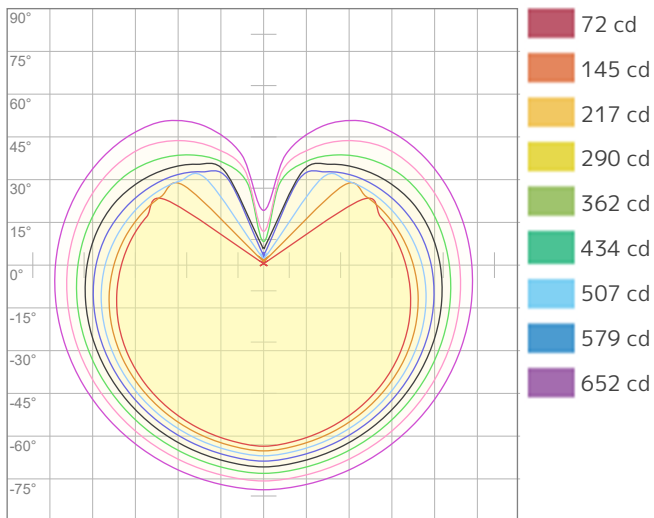
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

### ISO Diagrams

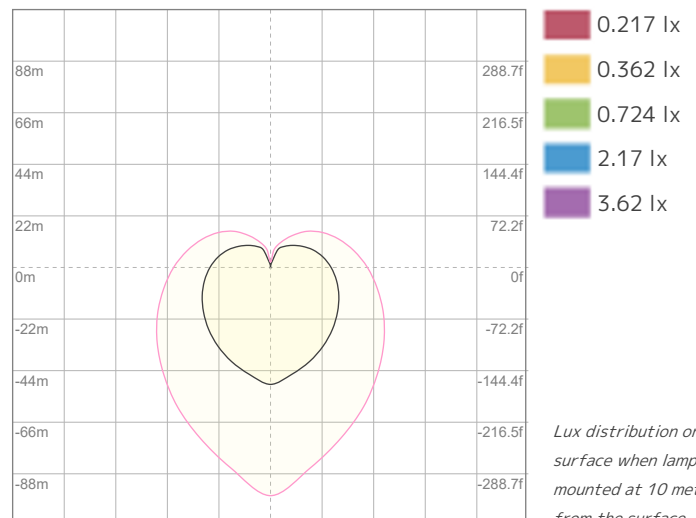


ISO Candela Diagram

Conditions:

Number of c-planes: 2

Candela at center: 724 cd



ISO LUX Diagram

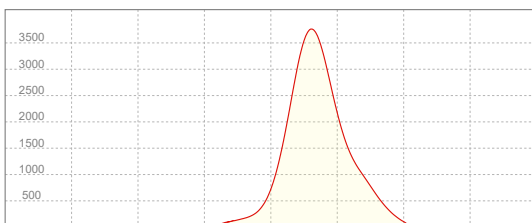
Conditions:

Number of c-planes: 2

LUX at center: 7.24 lx

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

### Linear Distribution



Peak Candela  
**3757 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3757 / \text{distance(m)}^2$$

$$\text{fc} = 3757 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4949 lm  
Peak Intensity: 3797 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

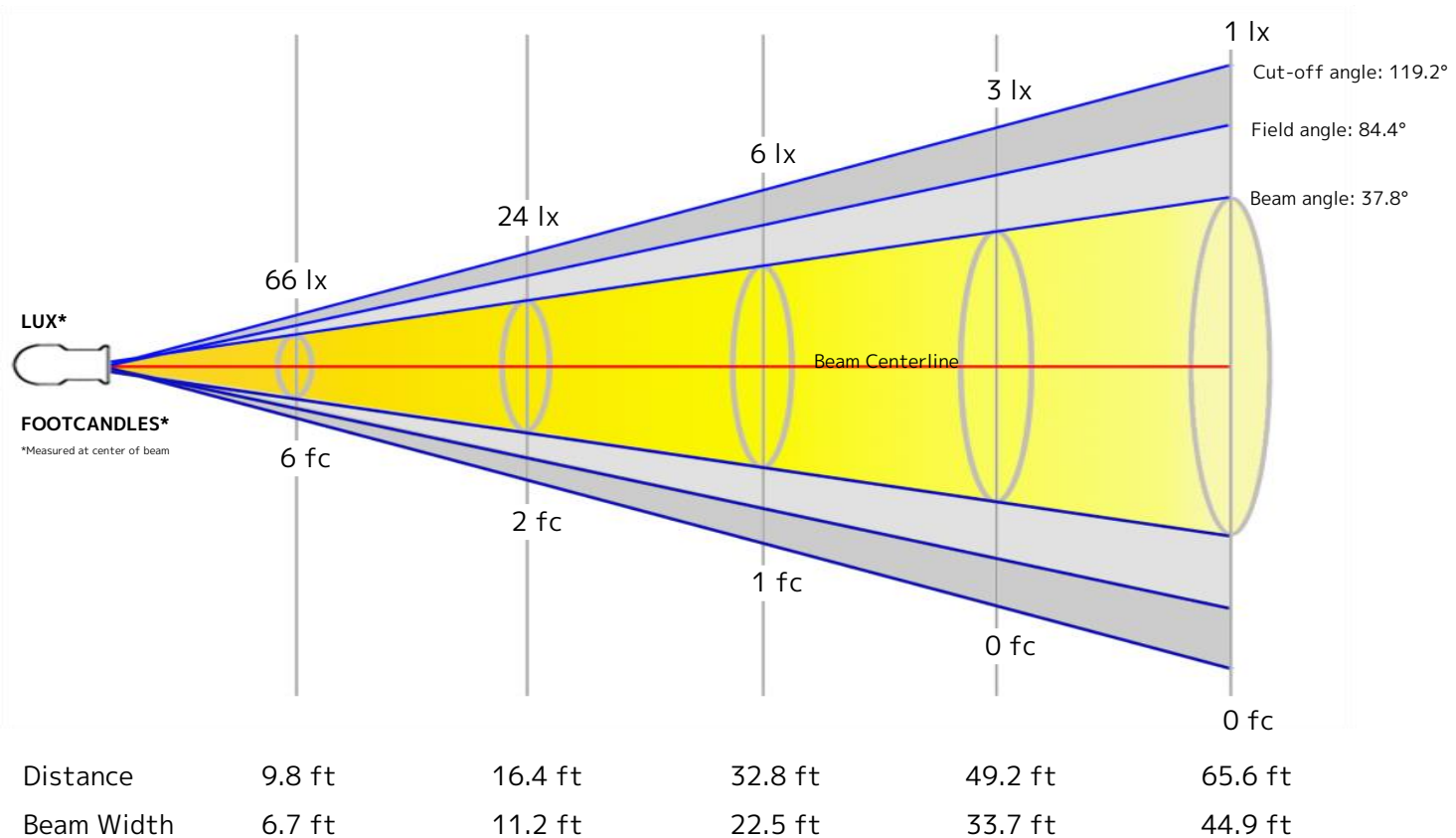
Color Temperature: 2417 K  
CRI: 96.5  
TLCI: 82  
TM30 R<sub>F</sub>: 93.7  
TM30 R<sub>g</sub>: 100.8

#### Power Details

Efficacy: 56 Lumen/Watt  
Power: 88.7 W  
Supply Voltage: 120 V  
Current: 0.746 A

### Beam Details

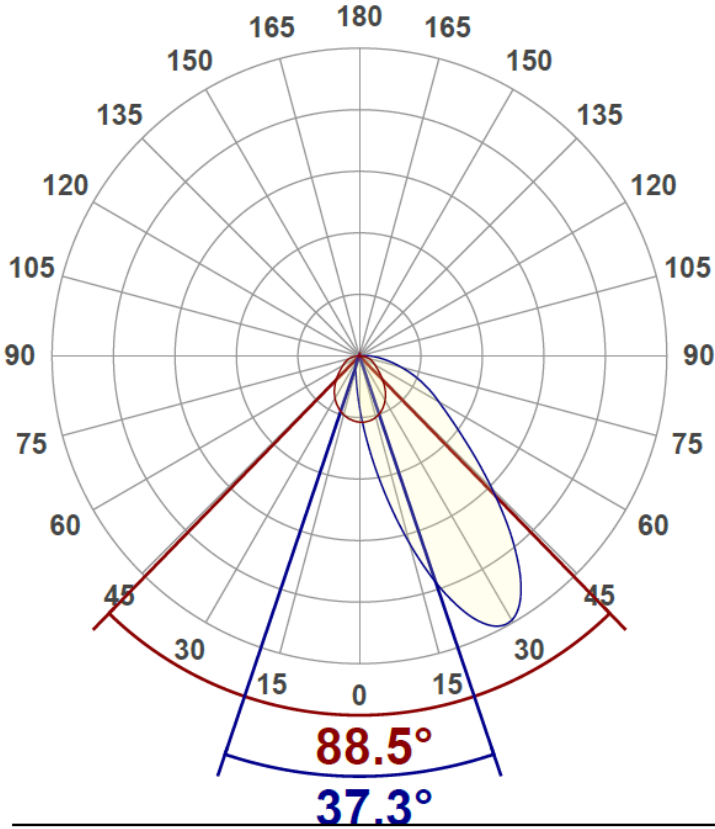
| Distance   | 3 m   | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-------|-------|-------|--------|--------|
| Beam Width | 2.1 m | 3.4 m | 6.9 m | 10.3 m | 13.7 m |



### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 598  | 150  | 66  | 37   | 24   | 17   | 12  | 9    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 55.6 | 13.9 | 6.2 | 3.5  | 2.2  | 1.5  | 1.1 | 0.9  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |

### Angular Distribution



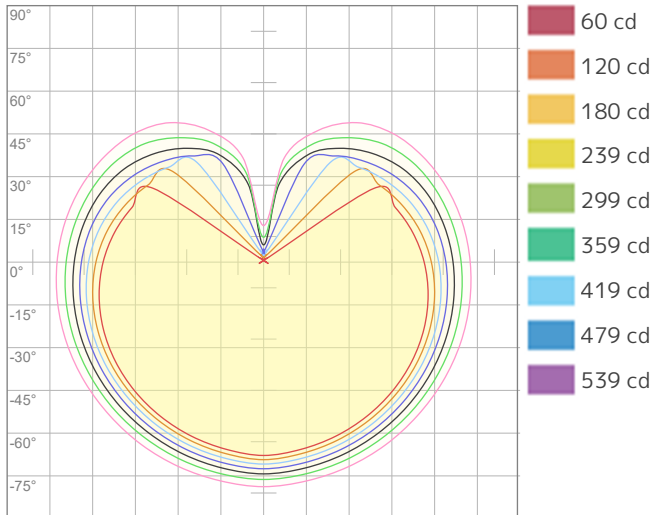
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

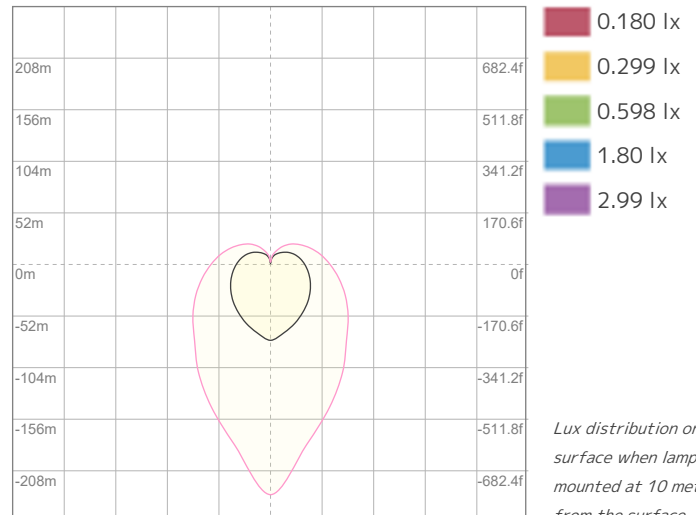
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 598 cd



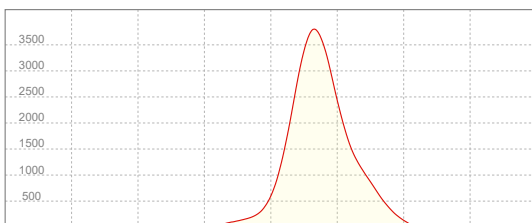
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.98 lx

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

### Linear Distribution



Peak Candela  
**3797 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3797 / \text{distance(m)}^2$$

$$\text{fc} = 3797 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4913 lm  
Peak Intensity: 3758 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

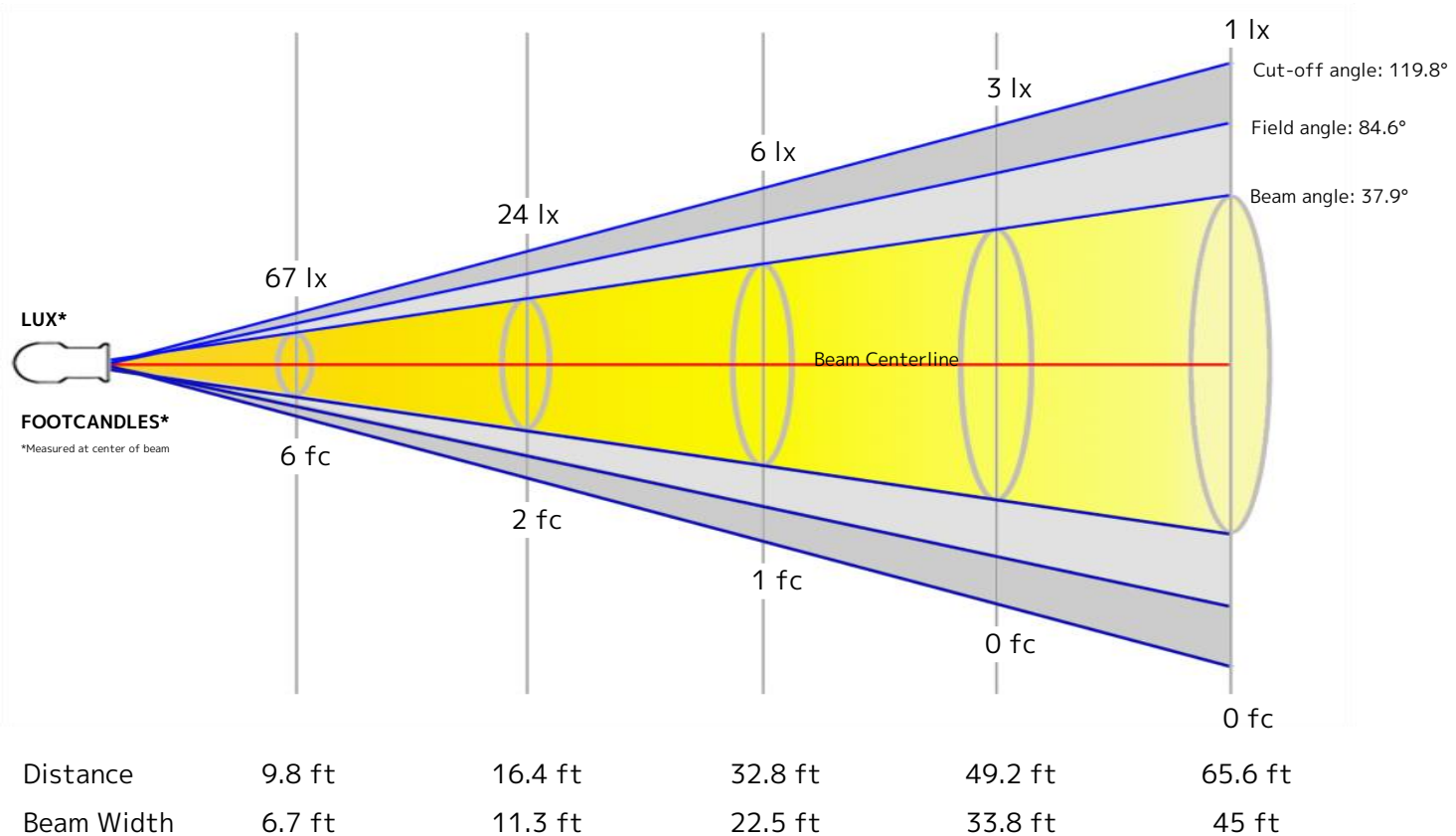
Color Temperature: 3198 K  
CRI: 96.4  
TLCI: 87  
TM30 R<sub>F</sub>: 93.8  
TM30 R<sub>g</sub>: 102.6

#### Power Details

Efficacy: 57 Lumen/Watt  
Power: 85.7 W  
Supply Voltage: 120 V  
Current: 0.722 A

### Beam Details

| Distance   | 3 m   | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-------|-------|-------|--------|--------|
| Beam Width | 2.1 m | 3.4 m | 6.9 m | 10.3 m | 13.7 m |

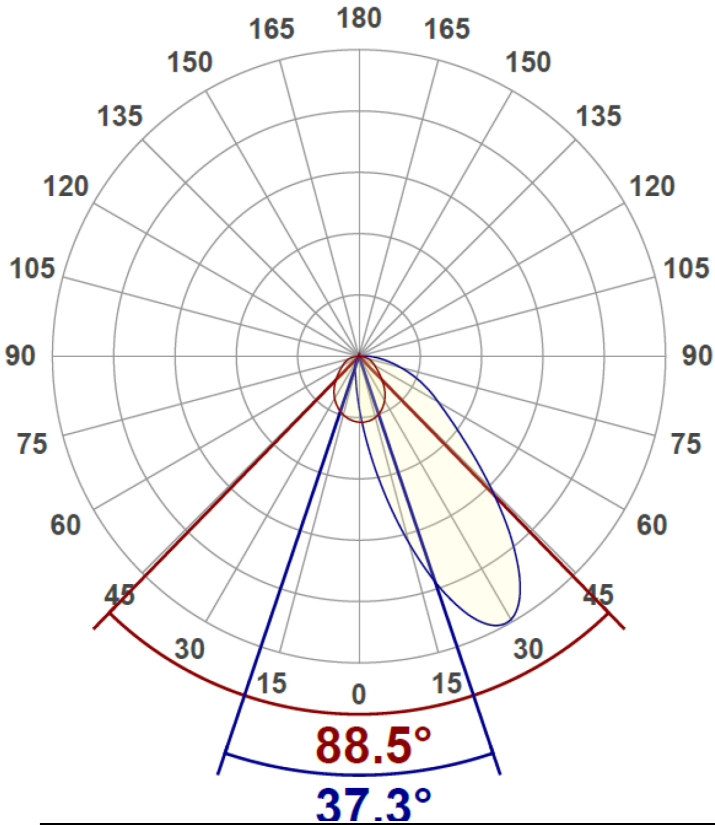


### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 599  | 150  | 67  | 37   | 24   | 17   | 12  | 9    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 55.6 | 13.9 | 6.2 | 3.5  | 2.2  | 1.5  | 1.1 | 0.9  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |



### Angular Distribution



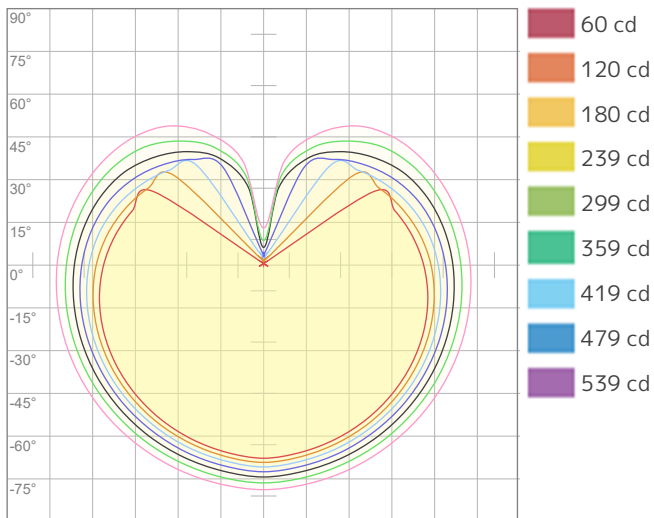
#### 0° Plane

|                     |
|---------------------|
| Beam Angle - 50%    |
| <b>88.5°</b>        |
| Field Angle - 10%   |
| <b>160.2°</b>       |
| Cutoff Angle - 2.5% |
| <b>171.5°</b>       |

#### 90° Plane

|                     |
|---------------------|
| Beam Angle - 50%    |
| <b>37.3°</b>        |
| Field Angle - 10%   |
| <b>84.5°</b>        |
| Cutoff Angle - 2.5% |
| <b>120.4°</b>       |

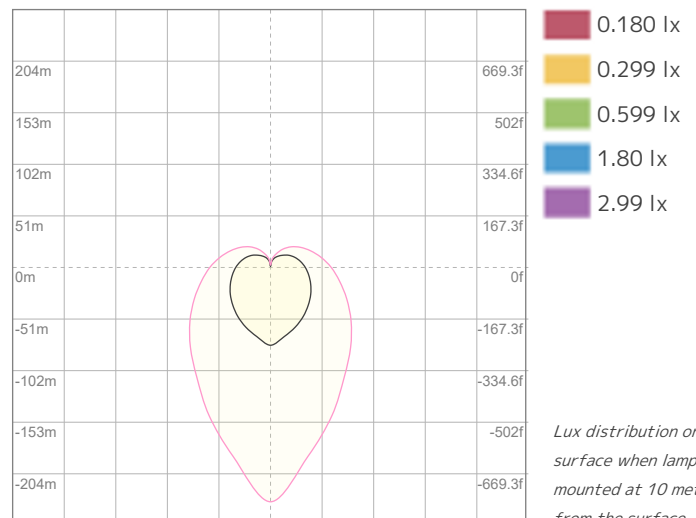
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 599 cd



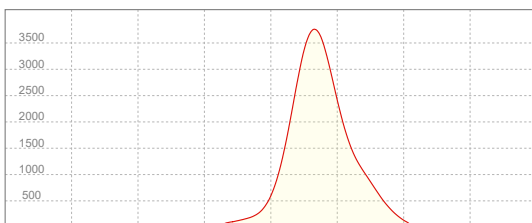
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.99 lx

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

### Linear Distribution



Peak Candela  
**3758 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3758 / \text{distance(m)}^2$$

$$\text{fc} = 3758 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4805 lm  
Peak Intensity: 3711 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

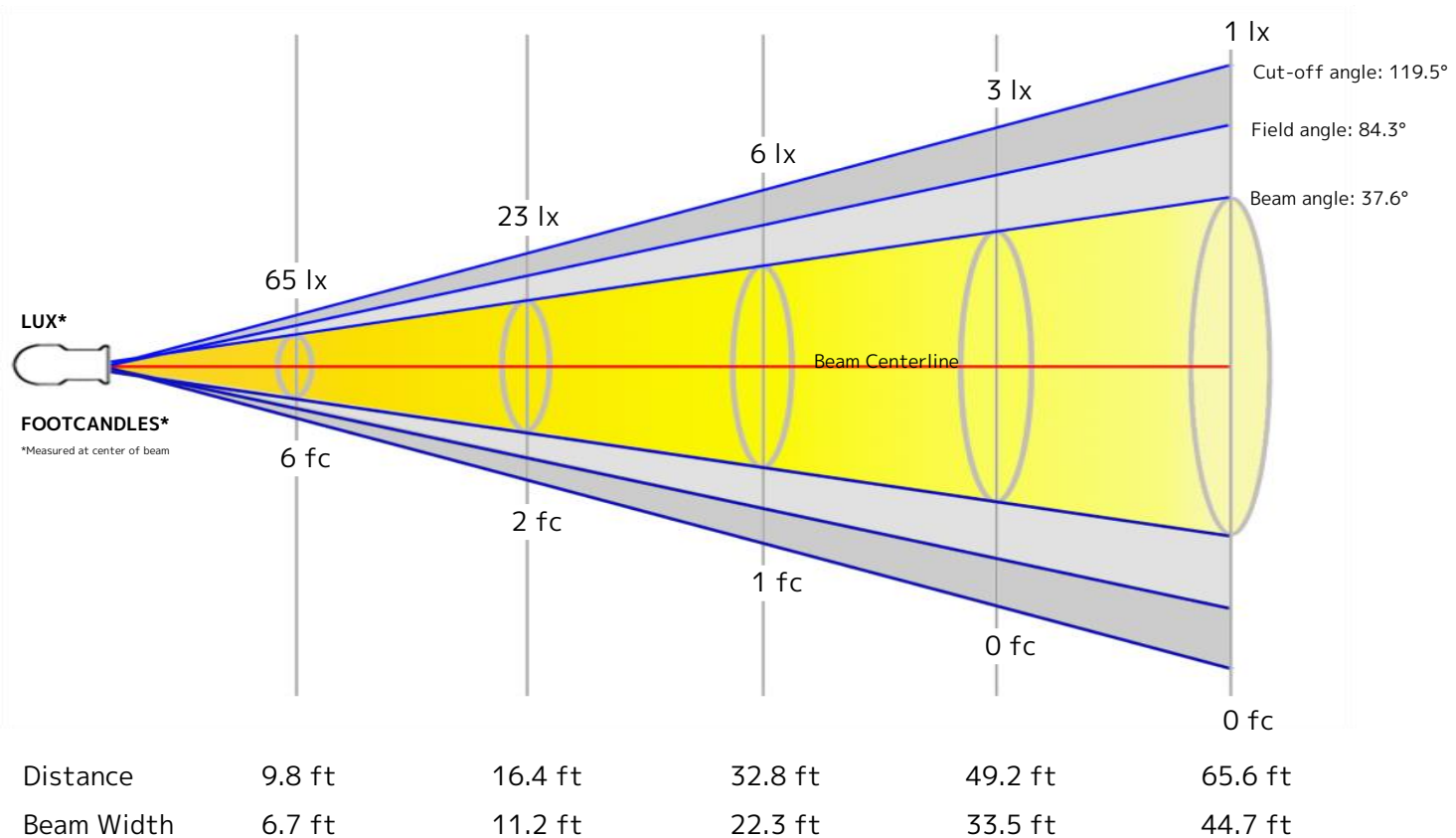
Color Temperature: 4480 K  
CRI: 95.6  
TLCI: 86  
TM30 R<sub>F</sub>: 93.1  
TM30 R<sub>g</sub>: 104.3

#### Power Details

Efficacy: 53 Lumen/Watt  
Power: 90.6 W  
Supply Voltage: 120 V  
Current: 0.760 A

### Beam Details

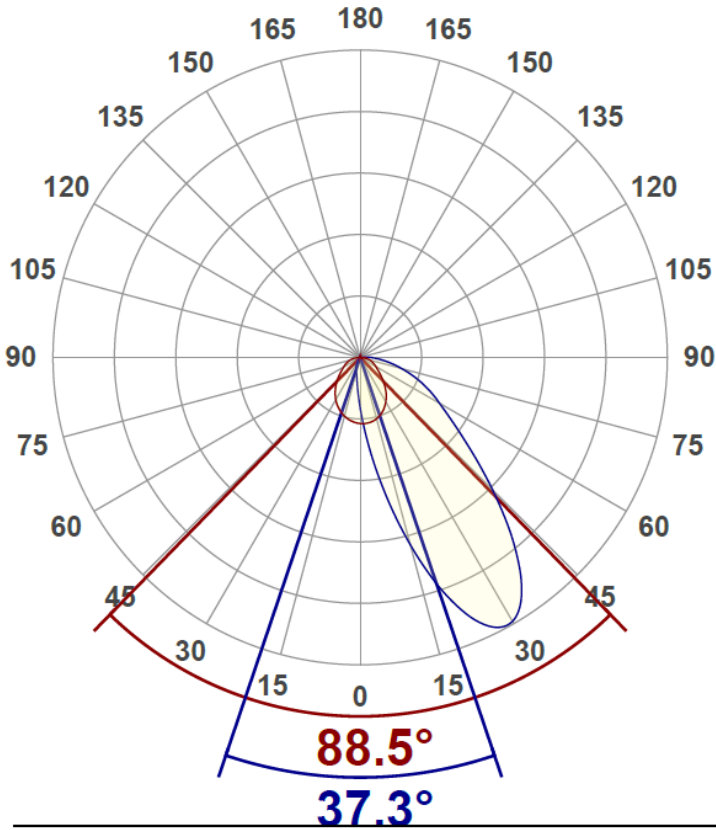
| Distance   | 3 m | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-----|-------|-------|--------|--------|
| Beam Width | m   | 3.4 m | 6.8 m | 10.2 m | 13.6 m |



### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 587  | 147  | 65  | 37   | 23   | 16   | 12  | 9    | 7    | 6    | 5    | 4    | 3    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 54.6 | 13.6 | 6.1 | 3.4  | 2.2  | 1.5  | 1.1 | 0.9  | 0.7  | 0.5  | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |

### Angular Distribution



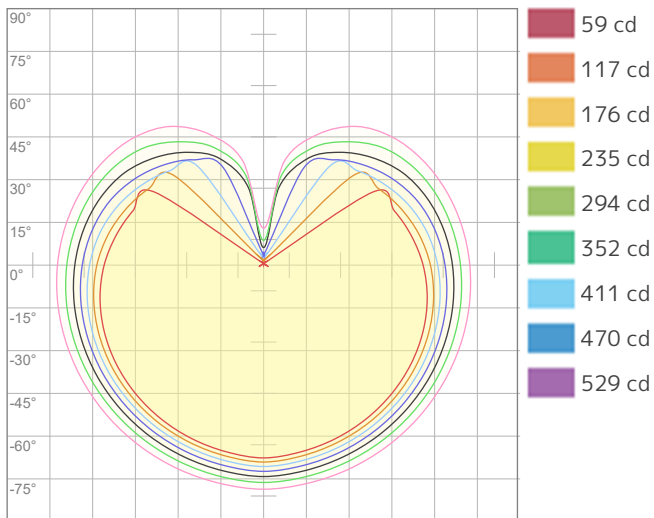
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

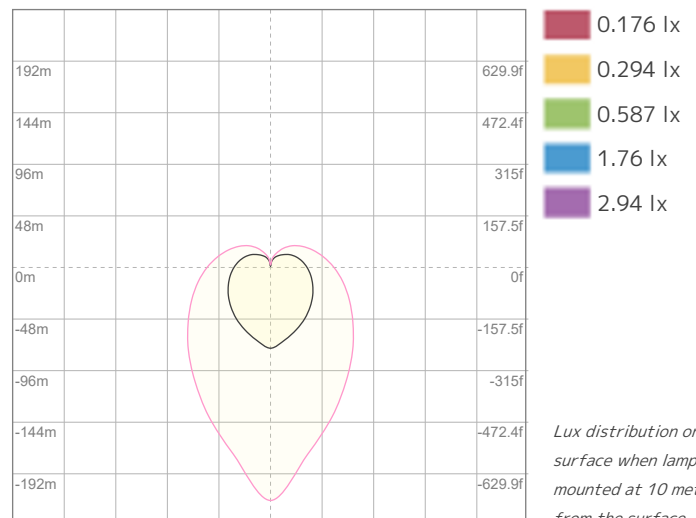
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 587 cd



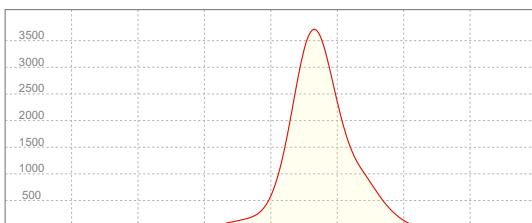
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.87 lx

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

### Linear Distribution



Peak Candela  
**3711 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3711 / \text{distance(m)}^2$$

$$\text{fc} = 3711 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4796 lm  
Peak Intensity: 3688 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

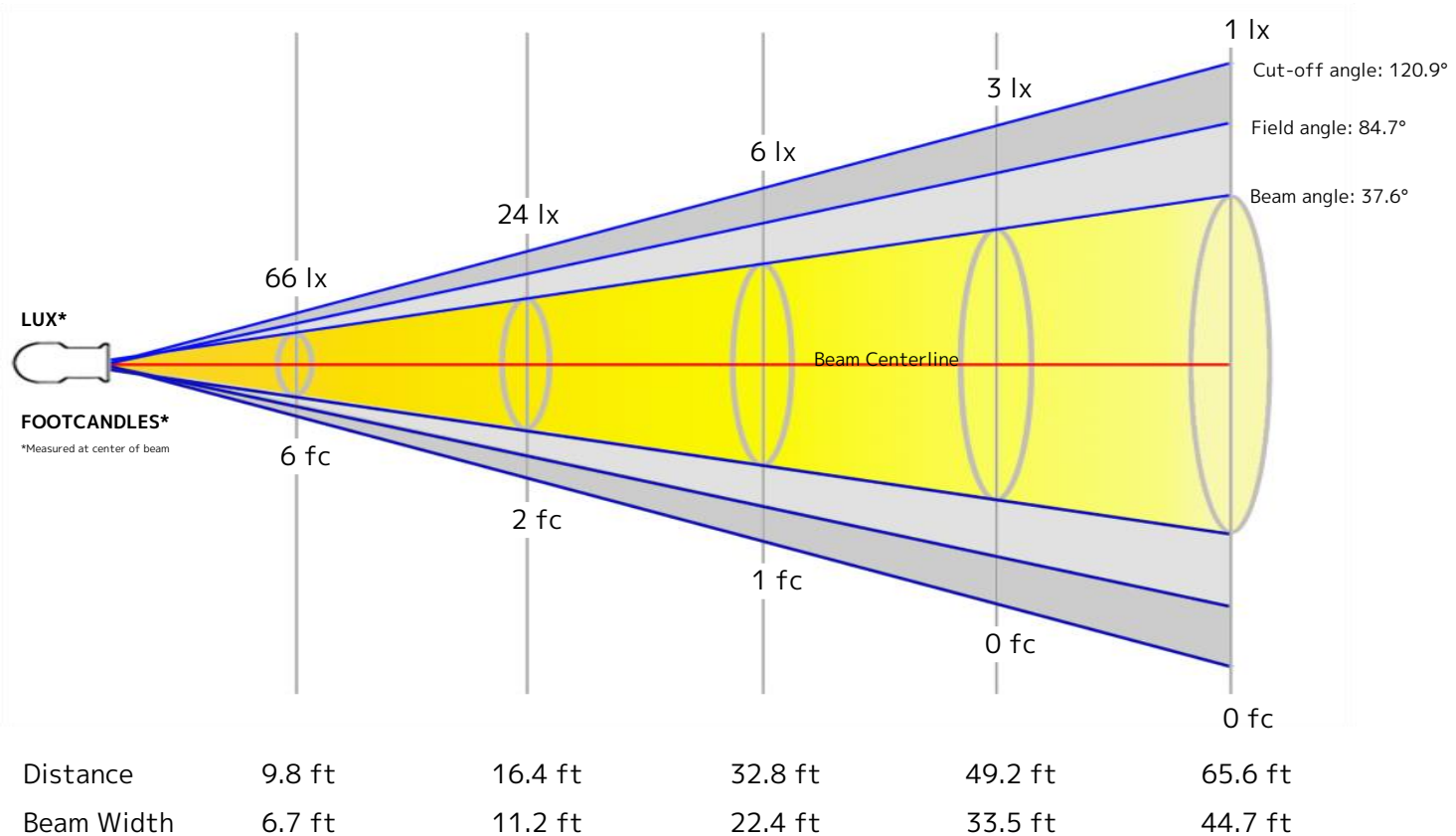
Color Temperature: 5631 K  
CRI: 94.0  
TLCI: 88  
TM30 R<sub>F</sub>: 91.9  
TM30 R<sub>g</sub>: 104.8

#### Power Details

Efficacy: 52 Lumen/Watt  
Power: 92.8 W  
Supply Voltage: 120 V  
Current: 0.780 A

### Beam Details

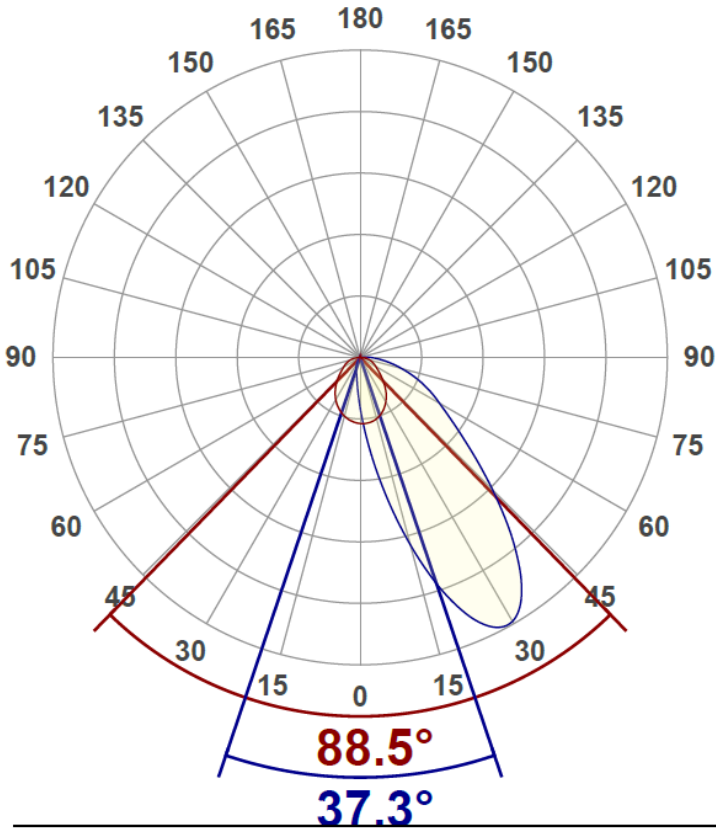
| Distance   | 3 m | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-----|-------|-------|--------|--------|
| Beam Width | m   | 3.4 m | 6.8 m | 10.2 m | 13.6 m |



### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 593  | 148  | 66  | 37   | 24   | 16   | 12  | 9    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 55.1 | 13.8 | 6.1 | 3.4  | 2.2  | 1.5  | 1.1 | 0.9  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |

### Angular Distribution



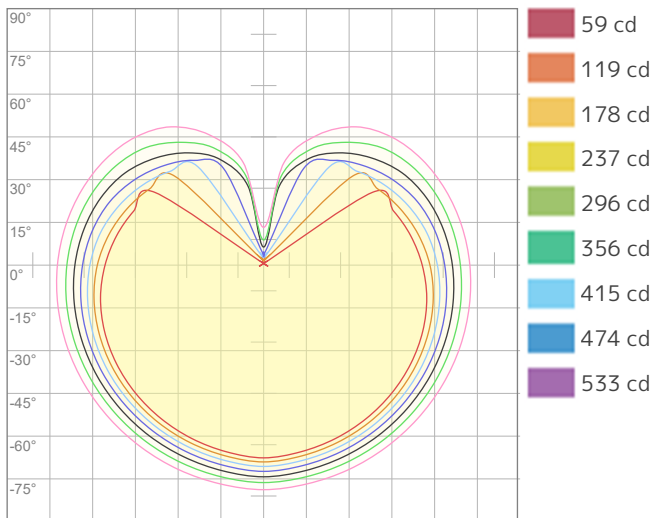
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

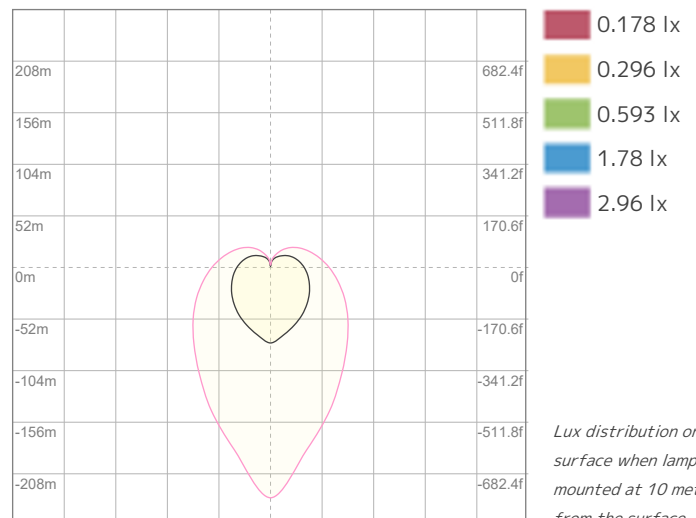
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 593 cd



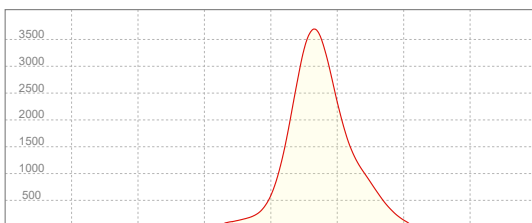
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.93 lx

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

### Linear Distribution



Peak Candela  
**3688 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3688 / \text{distance(m)}^2$$

$$\text{fc} = 3688 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4771 lm  
Peak Intensity: 3686 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

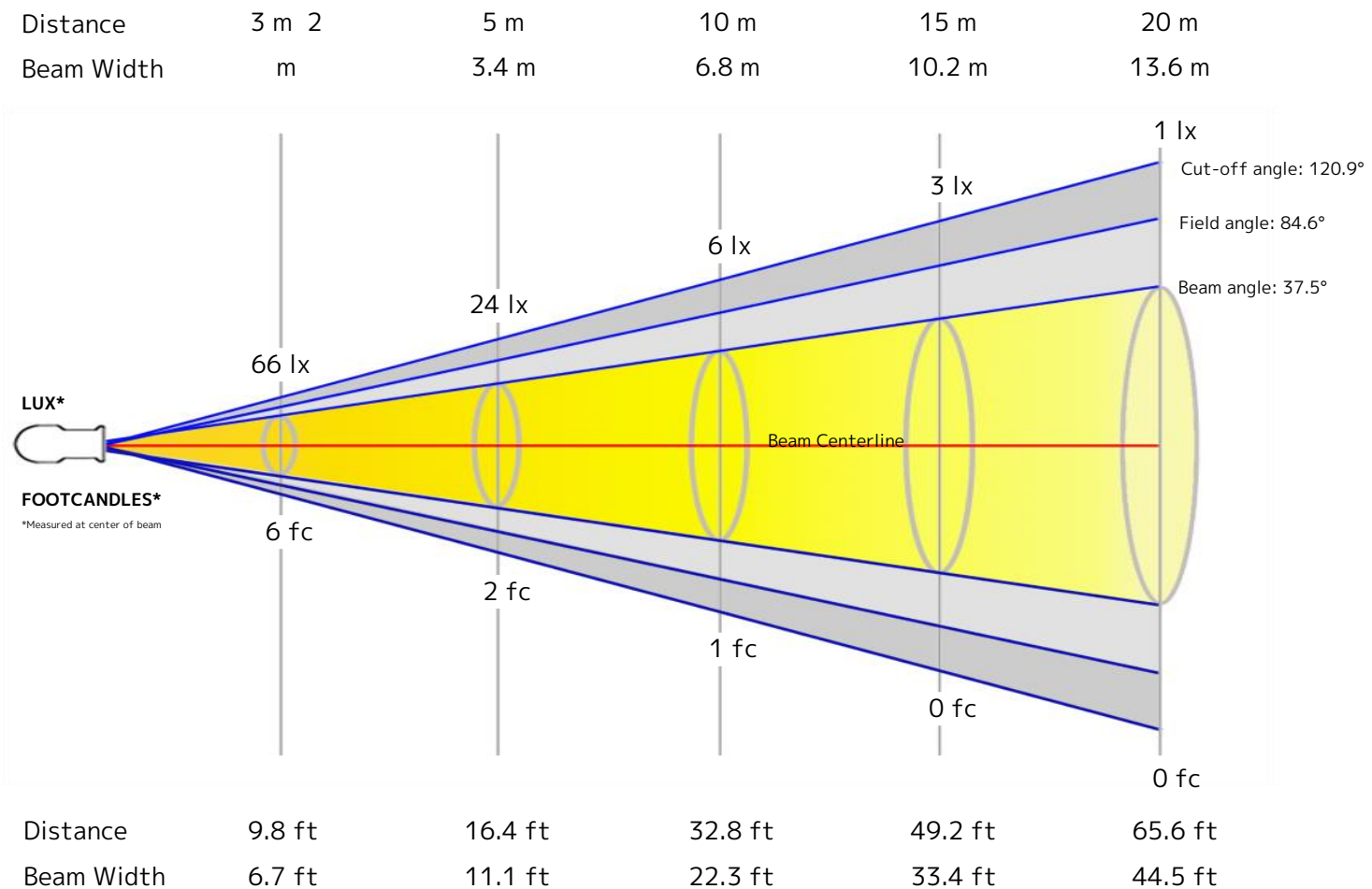
#### Color

Color Temperature: 6049 K  
CRI: 93.8  
TLCI: 88  
TM30 R<sub>F</sub>: 91.7  
TM30 R<sub>g</sub>: 104.9

#### Power Details

Efficacy: 51 Lumen/Watt  
Power: 93.3 W  
Supply Voltage: 120 V  
Current: 0.784 A

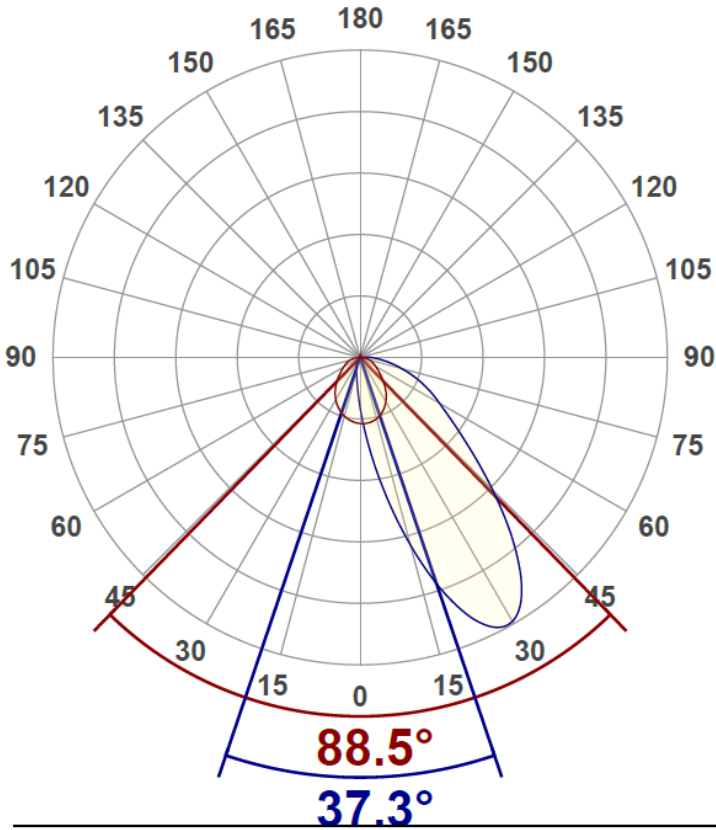
### Beam Details



### 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   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 597  | 149  | 66  | 37   | 24   | 17   | 12  | 9    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 55.5 | 13.9 | 6.2 | 3.5  | 2.2  | 1.5  | 1.1 | 0.9  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |

### Angular Distribution



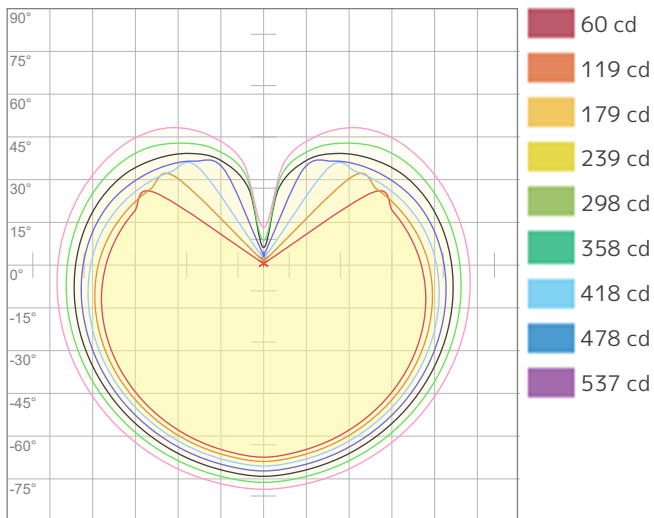
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

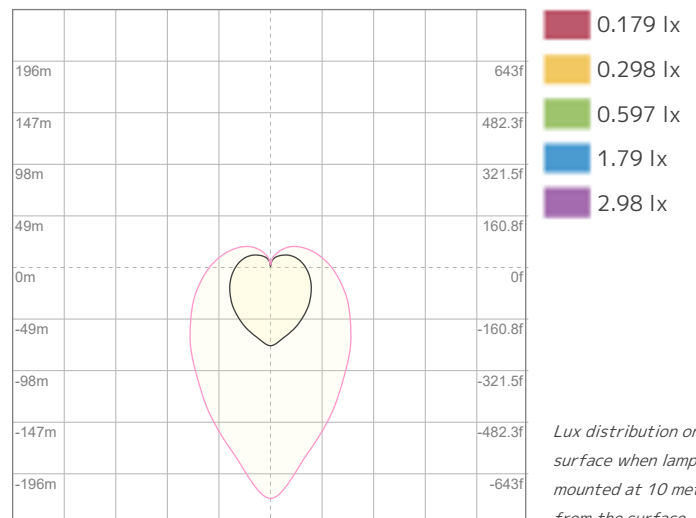
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 597 cd



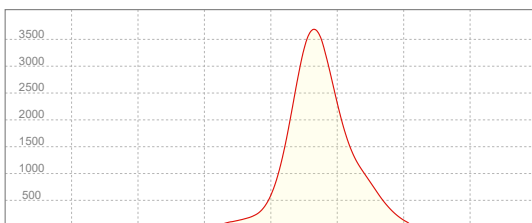
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.97 lx

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

### Linear Distribution



Peak Candela  
**3686 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3686 / \text{distance(m)}^2$$

$$\text{fc} = 3686 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4722 lm  
Peak Intensity: 3639 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

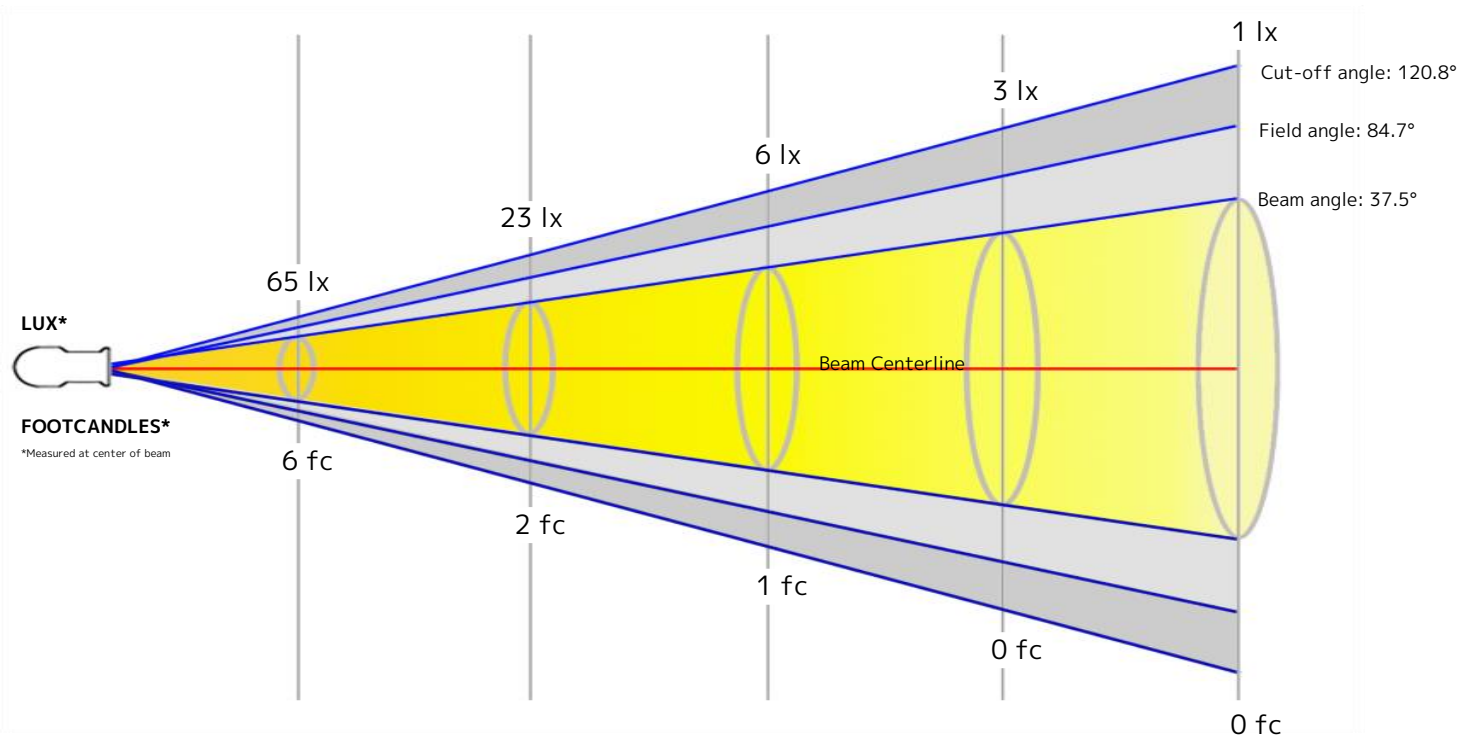
Color Temperature: 6477 K  
CRI: 93.6  
TLCI: 88  
TM30 R<sub>F</sub>: 91.7  
TM30 R<sub>g</sub>: 104.9

#### Power Details

Efficacy: 50 Lumen/Watt  
Power: 93.9 W  
Supply Voltage: 121 V  
Current: 0.784 A

### Beam Details

| Distance   | 3 m | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-----|-------|-------|--------|--------|
| Beam Width | m   | 3.4 m | 6.8 m | 10.2 m | 13.6 m |



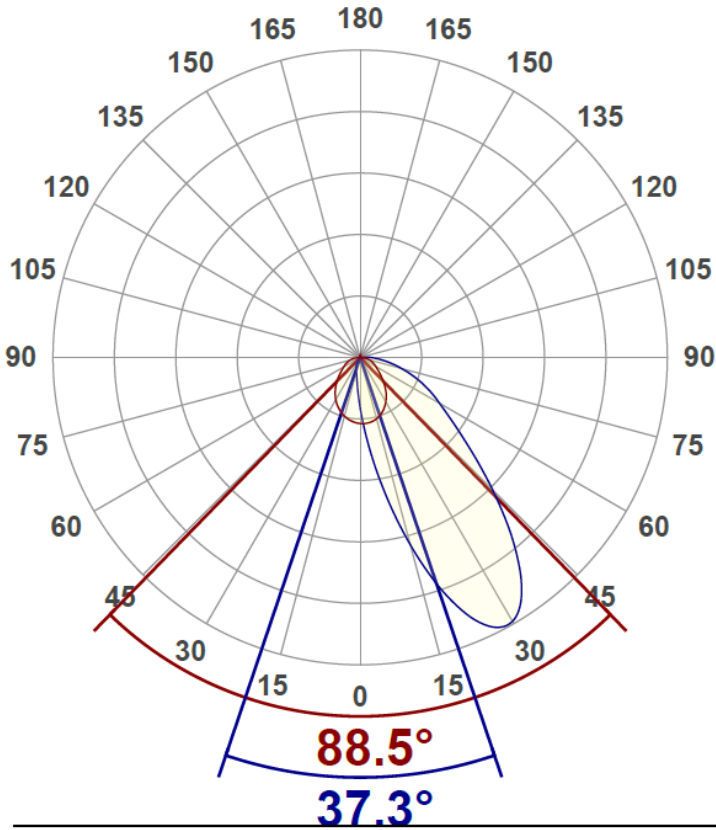
|            |        |         |         |         |         |
|------------|--------|---------|---------|---------|---------|
| Distance   | 9.8 ft | 16.4 ft | 32.8 ft | 49.2 ft | 65.6 ft |
| Beam Width | 6.7 ft | 11.1 ft | 22.3 ft | 33.4 ft | 44.5 ft |

### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 585  | 146  | 65  | 37   | 23   | 16   | 12  | 9    | 7    | 6    | 5    | 4    | 3    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 54.3 | 13.6 | 6   | 3.4  | 2.2  | 1.5  | 1.1 | 0.8  | 0.7  | 0.5  | 0.4  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |



### Angular Distribution



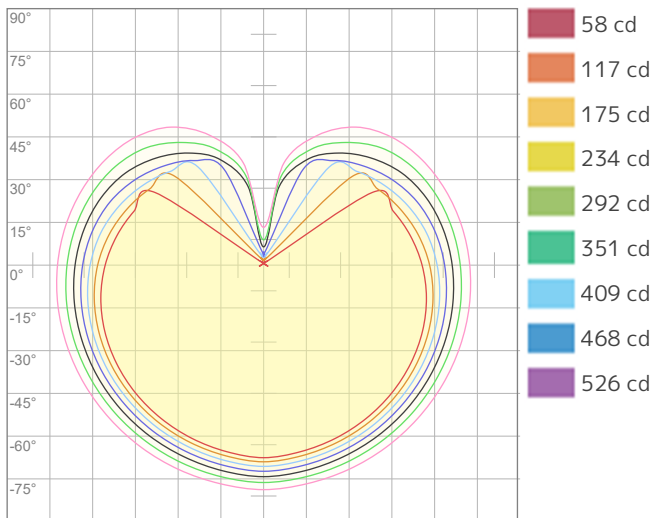
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

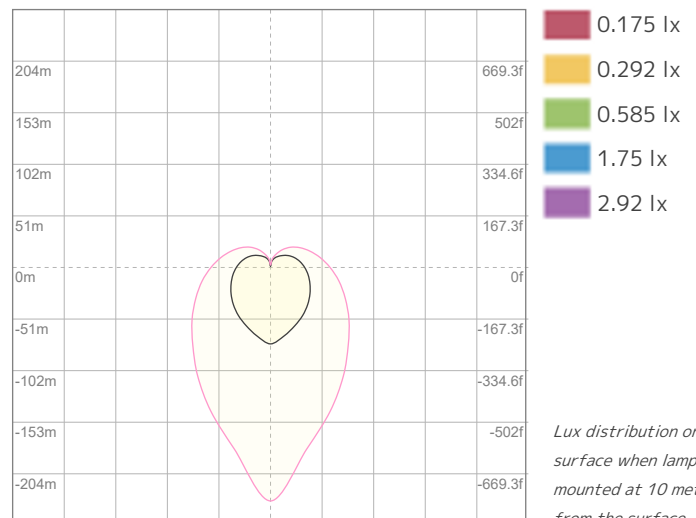
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 585 cd



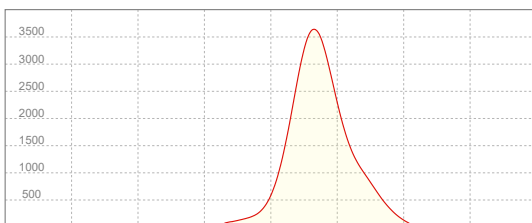
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.85 lx

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

### Linear Distribution



Peak Candela  
**3639 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3639 / \text{distance(m)}^2$$

$$\text{fc} = 3639 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4650 lm  
Peak Intensity: 3592 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

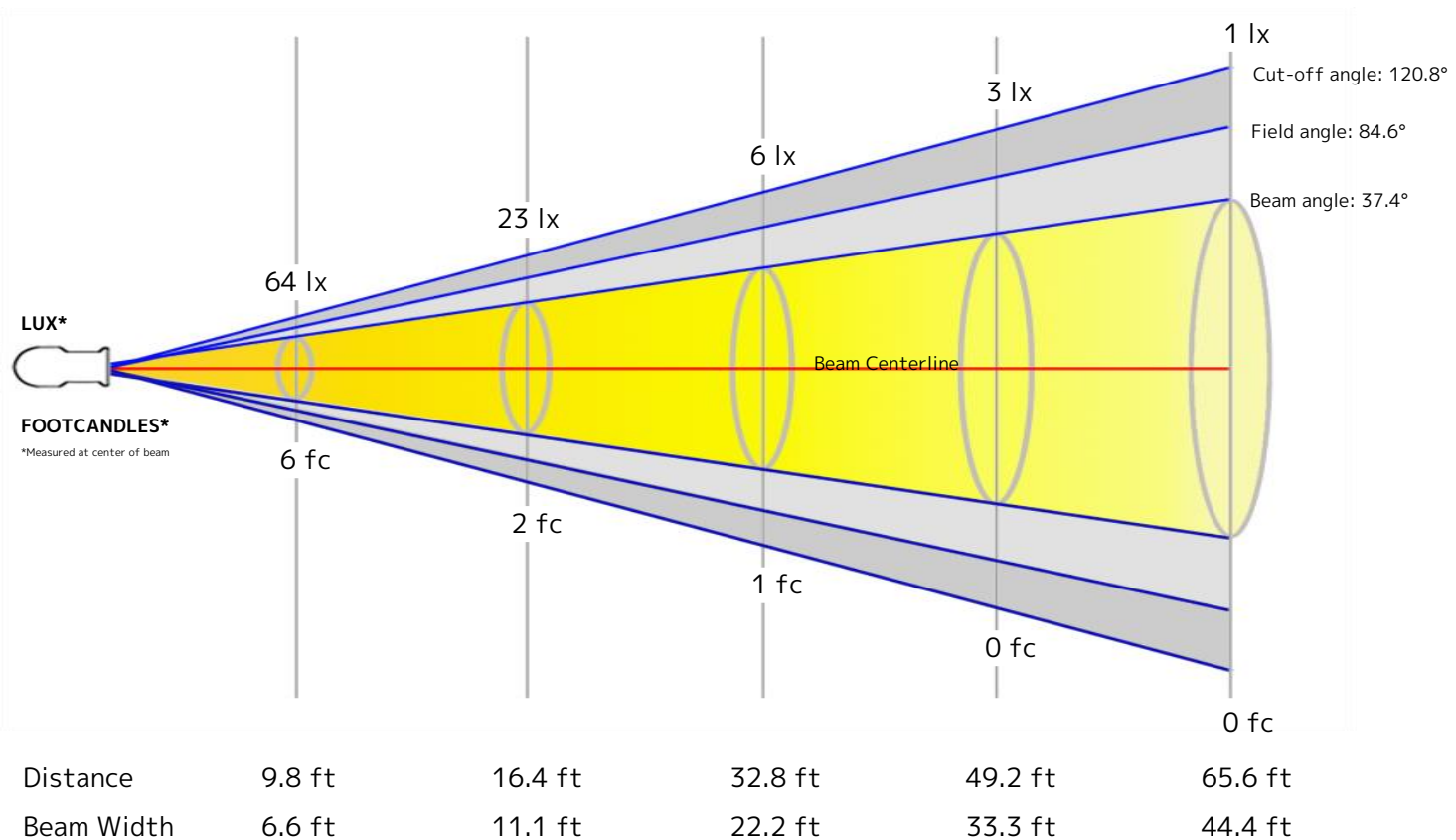
Color Temperature: 7551 K  
CRI: 93.2  
TLCI: 88  
TM30 R<sub>F</sub>: 91.1  
TM30 R<sub>g</sub>: 104.5

#### Power Details

Efficacy: 49 Lumen/Watt  
Power: 94.8 W  
Supply Voltage: 120 V  
Current: 0.797 A

### Beam Details

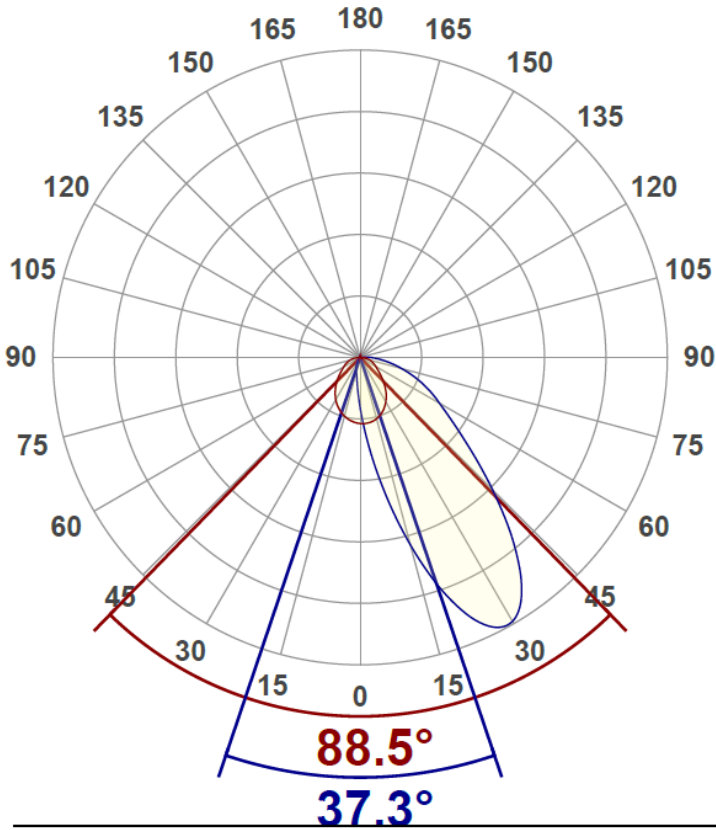
| Distance   | 3 m | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-----|-------|-------|--------|--------|
| Beam Width | m   | 3.4 m | 6.8 m | 10.2 m | 13.5 m |



### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 578  | 145  | 64  | 36   | 23   | 16   | 12  | 9    | 7    | 6    | 5    | 4    | 3    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 53.7 | 13.4 | 6   | 3.4  | 2.1  | 1.5  | 1.1 | 0.8  | 0.7  | 0.5  | 0.4  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  | 0.1  |

### Angular Distribution



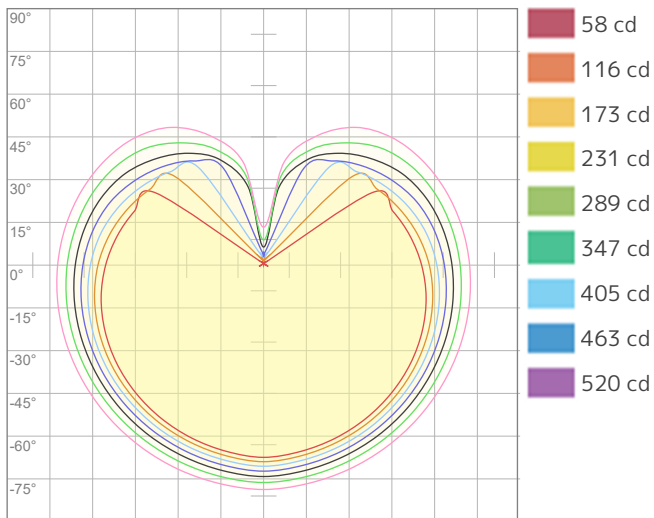
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

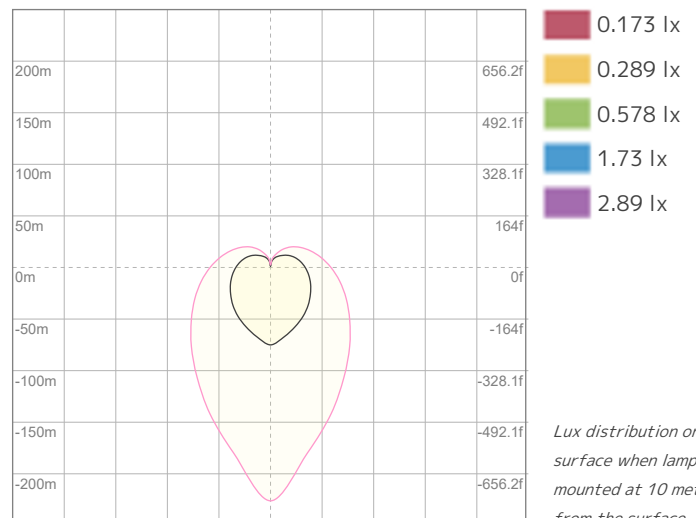
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 578 cd



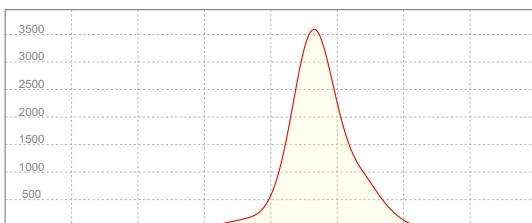
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.78 lx

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

### Linear Distribution



Peak Candela  
**3592 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3592 / \text{distance(m)}^2$$

$$\text{fc} = 3592 / \text{distance(ft)}^2$$

### Key Measurements

#### Output

Total Lumen Output: 4628 lm  
Peak Intensity: 3571 cd

#### Beam

Beam Angle (50%): 88.5° x 37.3°  
Field Angle (10%): 160.2° x 84.5°  
Cutoff Angle (2.5%): 171.5° x 120.4°

#### Color

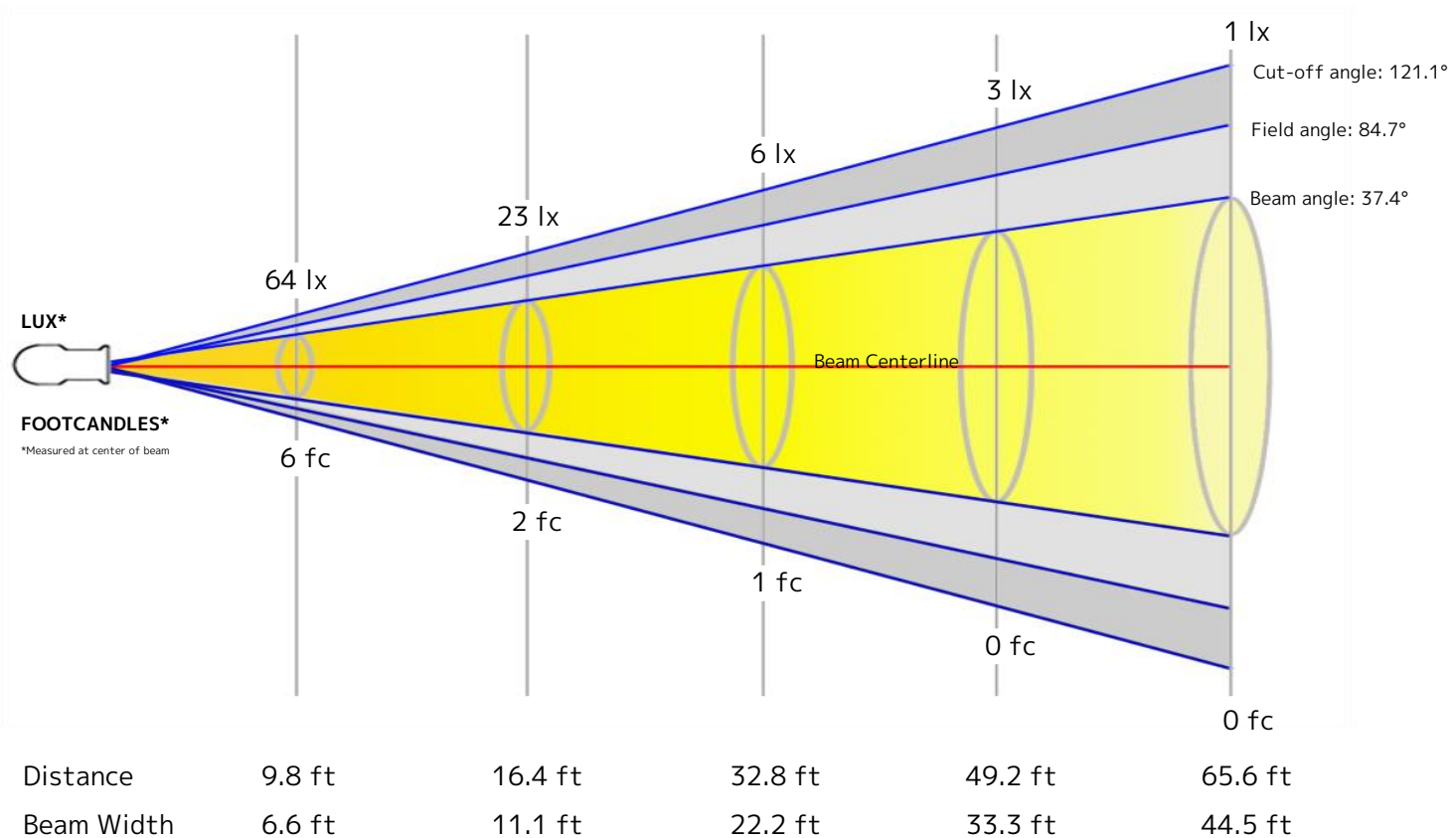
Color Temperature: 7800 K  
CRI: 93.2  
TLCI: 88  
TM30 R<sub>F</sub>: 90.9  
TM30 R<sub>g</sub>: 104.3

#### Power Details

Efficacy: 49 Lumen/Watt  
Power: 94.5 W  
Supply Voltage: 121 V  
Current: 0.789 A

### Beam Details

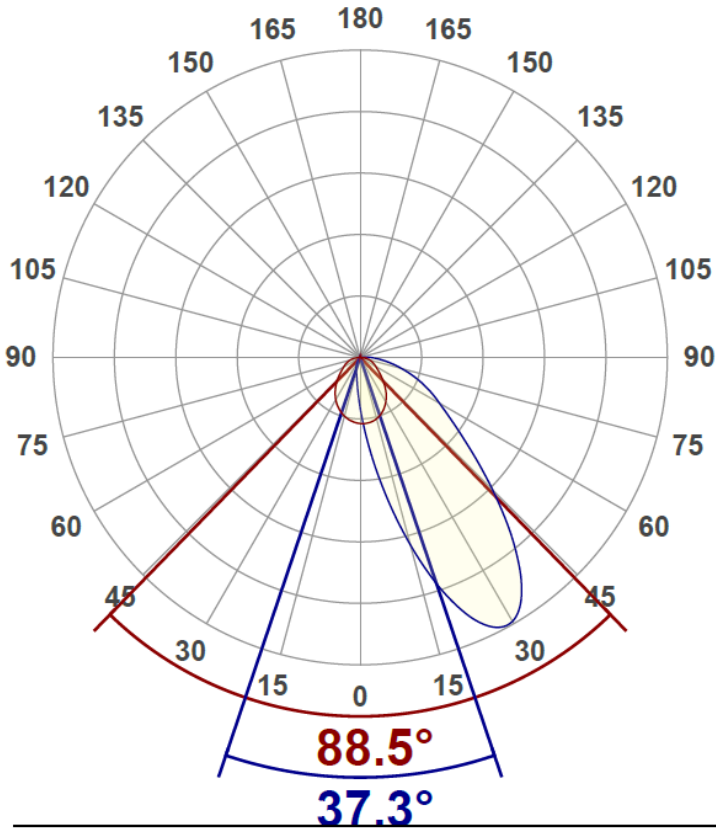
| Distance   | 3 m | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-----|-------|-------|--------|--------|
| Beam Width | m   | 3.4 m | 6.8 m | 10.2 m | 13.6 m |



### Beam Intensities from 1-20m

| M         | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 575  | 144  | 64  | 36   | 23   | 16   | 12  | 9    | 7    | 6    | 5    | 4    | 3    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| <b>FT</b> | 3.3  | 6.6  | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 53.5 | 13.4 | 5.9 | 3.3  | 2.1  | 1.5  | 1.1 | 0.8  | 0.7  | 0.5  | 0.4  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  | 0.1  |

### Angular Distribution



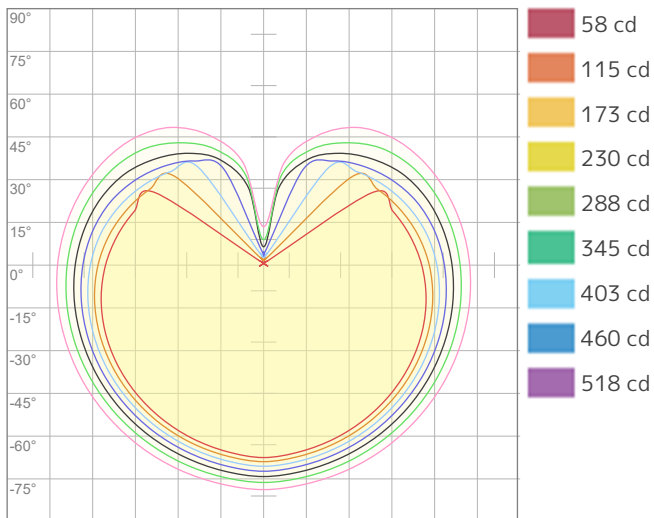
#### 0° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 88.5°  |
| Field Angle - 10%   | 160.2° |
| Cutoff Angle - 2.5% | 171.5° |

#### 90° Plane

|                     |        |
|---------------------|--------|
| Beam Angle - 50%    | 37.3°  |
| Field Angle - 10%   | 84.5°  |
| Cutoff Angle - 2.5% | 120.4° |

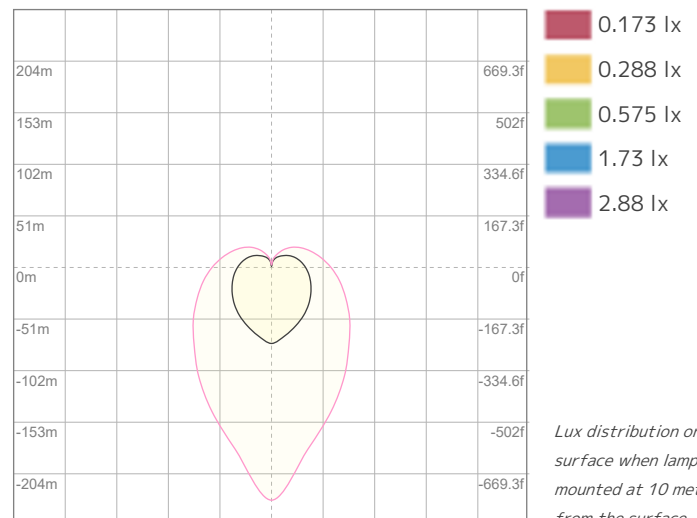
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 575 cd



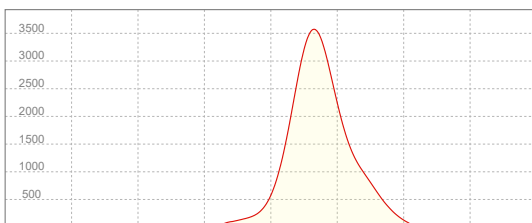
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 5.75 lx

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

### Linear Distribution



Peak Candela  
**3571 cd**

Calculate Center Beam Intensities

$$\text{lux} = 3571 / \text{distance(m)}^2$$

$$\text{fc} = 3571 / \text{distance(ft)}^2$$

## Key Measurements

### Output

Total Lumen Output: 5276 lm  
Peak Intensity: 5837 cd

### Beam

Beam Angle (50%): 76.2° x 25°  
Field Angle (10%): 126.3° x 80.6°  
Cutoff Angle (2.5%): 135.4° x 84.3°

### Color

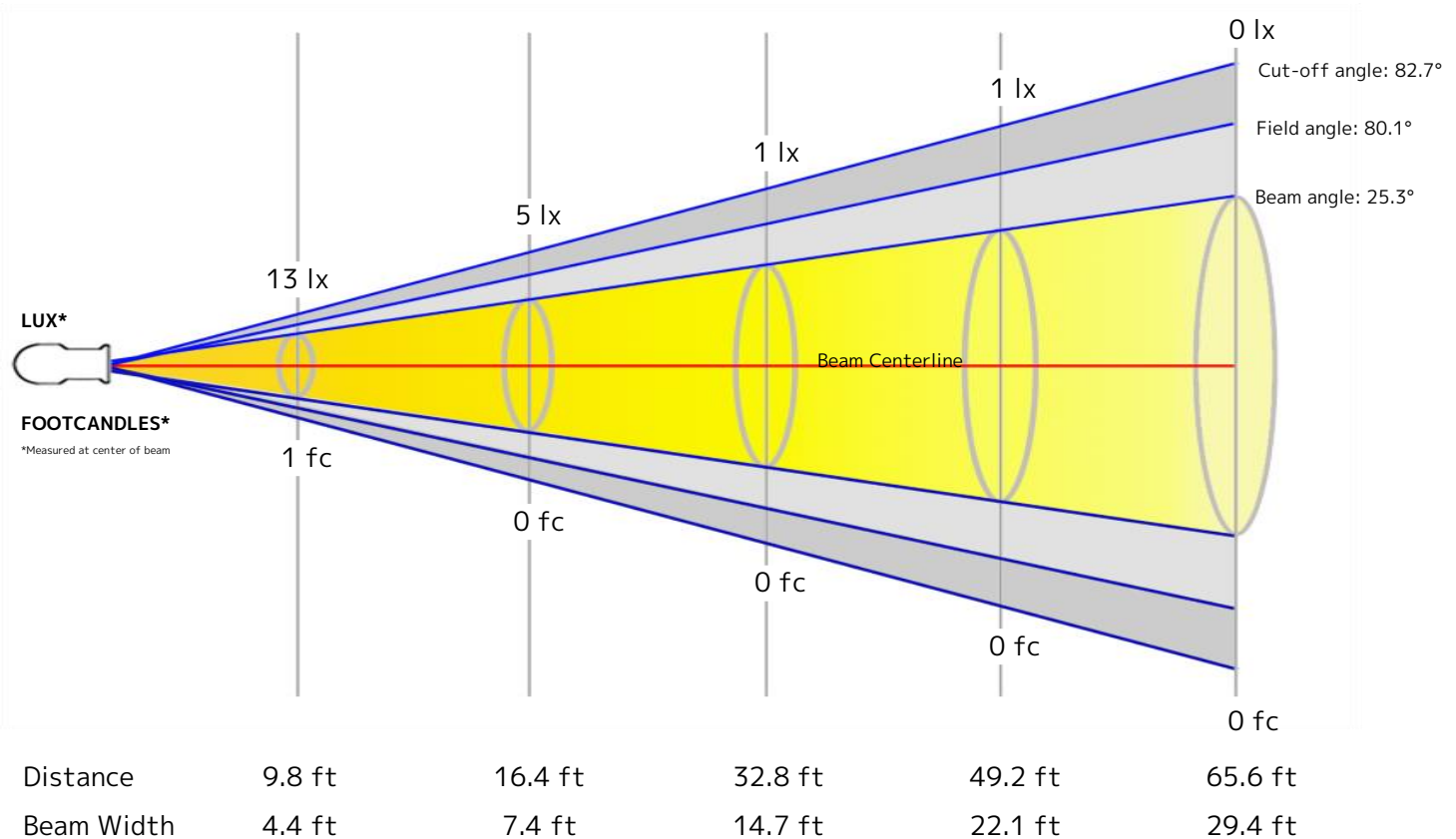
Color Temperature: 5819 K  
CRI: 93.4  
TLCI: 88  
TM30 R<sub>F</sub>: 92.4  
TM30 R<sub>g</sub>: 103.4

### Power Details

Efficacy: 57 Lumen/Watt  
Power: 93.4 W  
Supply Voltage: 120 V  
Current: 0.780 A

## Beam Details

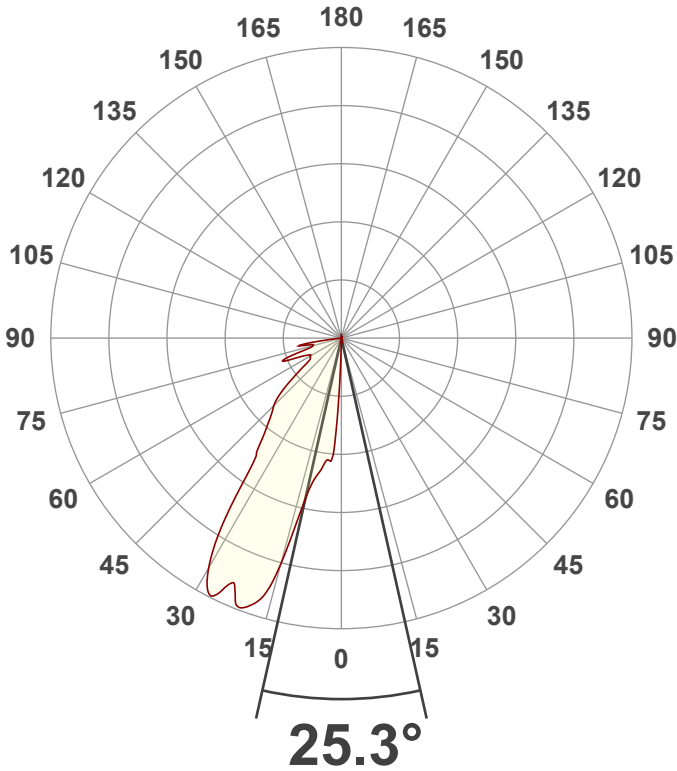
| Distance   | 3 m   | 5 m   | 10 m  | 15 m  | 20 m |
|------------|-------|-------|-------|-------|------|
| Beam Width | 1.3 m | 2.2 m | 4.5 m | 6.7 m | 9 m  |



## Beam Intensities from 1-20m

| M         | 1    | 2   | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|-----|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>LX</b> | 117  | 29  | 13  | 7    | 5    | 3    | 2   | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 0    | 0    | 0    | 0    | 0    |
| <b>FT</b> | 3.3  | 6.6 | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>FC</b> | 10.9 | 2.7 | 1.2 | 0.7  | 0.4  | 0.3  | 0.2 | 0.2  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  | 0    | 0    | 0    | 0    | 0    | 0    |

### Angular Distribution



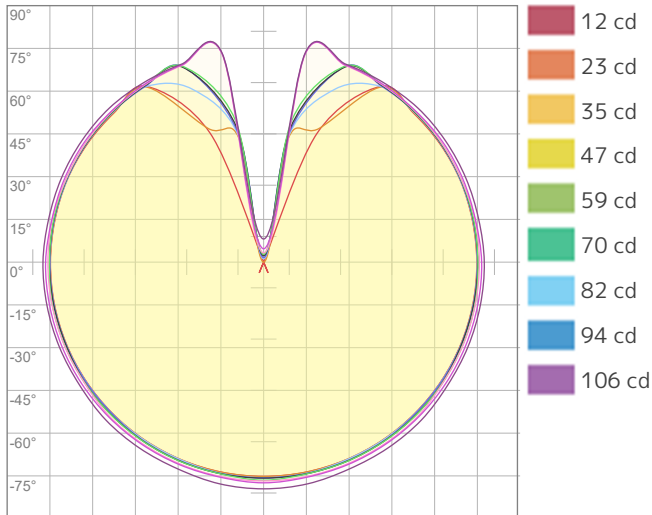
### 0° Plane

| Beam Angle - 50%    |
|---------------------|
| 25.3°               |
| Field Angle - 10%   |
| 80.1°               |
| Cutoff Angle - 2.5% |
| 82.7°               |

### 90° Plane

| Beam Angle - 50%    |
|---------------------|
| 76.2°               |
| Field Angle - 10%   |
| 126.3°              |
| Cutoff Angle - 2.5% |
| 135.4°              |

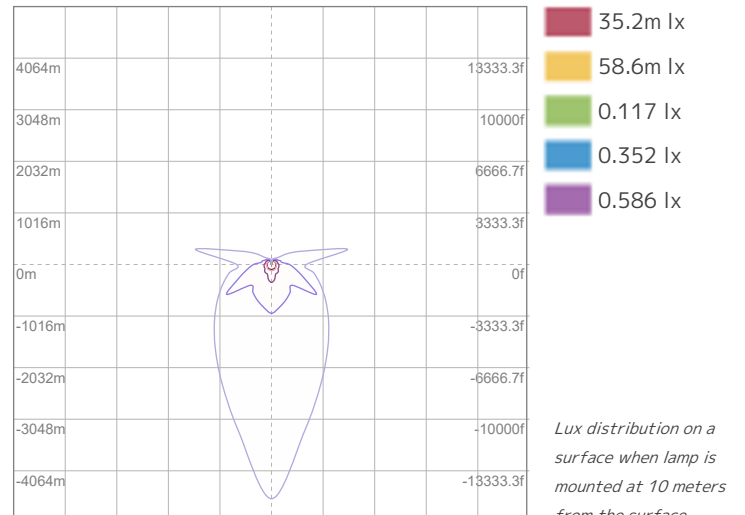
### ISO Diagrams



ISO Candela Diagram

Conditions:

Number of c-planes: 2  
Candela at center: 117 cd



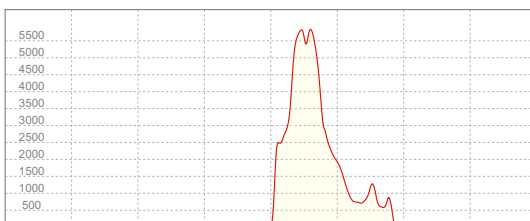
ISO LUX Diagram

Conditions:

Number of c-planes: 2  
LUX at center: 1.17 lx

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

### Linear Distribution



**Peak Candela**  
**5837 cd**

### Calculate Center Beam Intensities

$$\text{lux} = 5837 / \text{distance(m)}^2$$

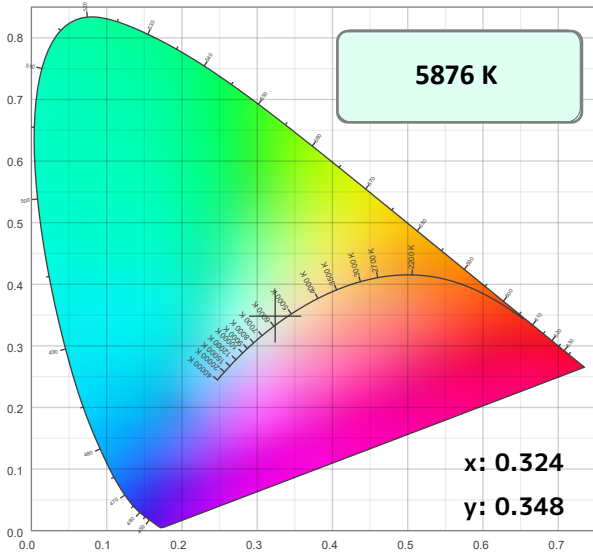
$$\text{fc} = 5837 / \text{distance(ft)}^2$$

### Color Temperature: 5876K

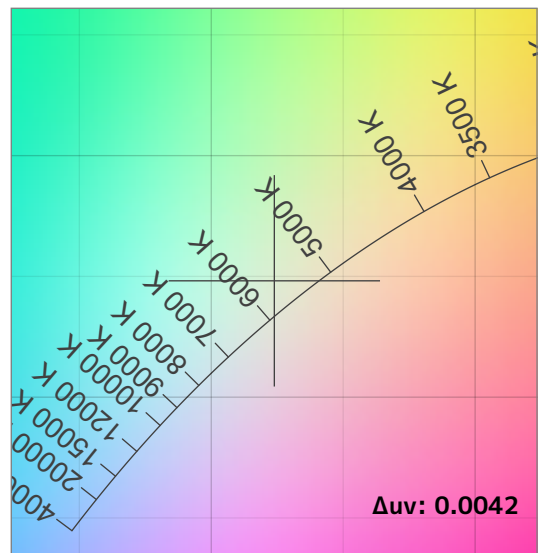
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSIt                 | SSId                   |
| 93.6                  | 79.7                                      | 92.5                 | 103.7               | 87                                    | 94.3                | 0.324                      | 0.348                      | 0.0042                          | 32                   | 59                     |

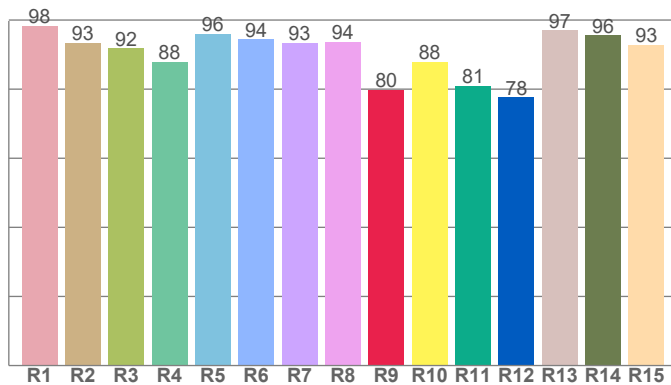
#### CIE 1931



#### CIE 1931 ZOOMED

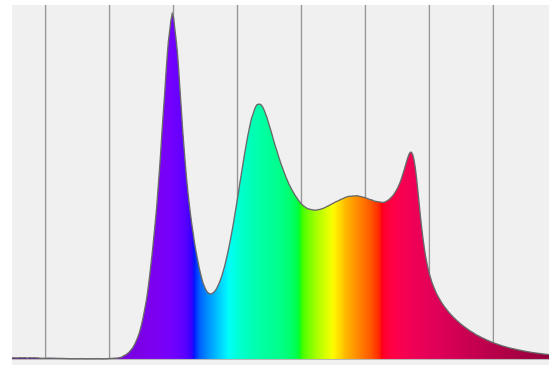


#### CRI: 93.6 (R1-R8)



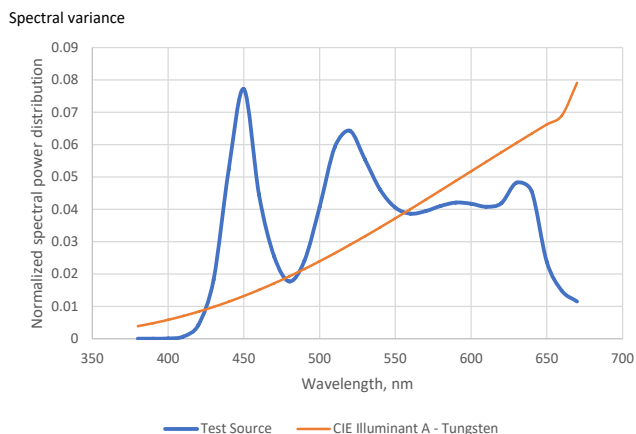
#### Spectral Power Distribution (SPD)

Dominant Wavelength 570 nm



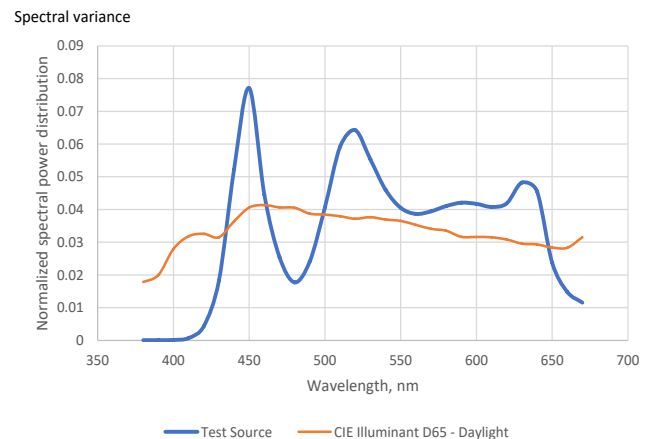
#### SSI Spectral Variance Graph- Tungsten

SSI [CIE A] 32

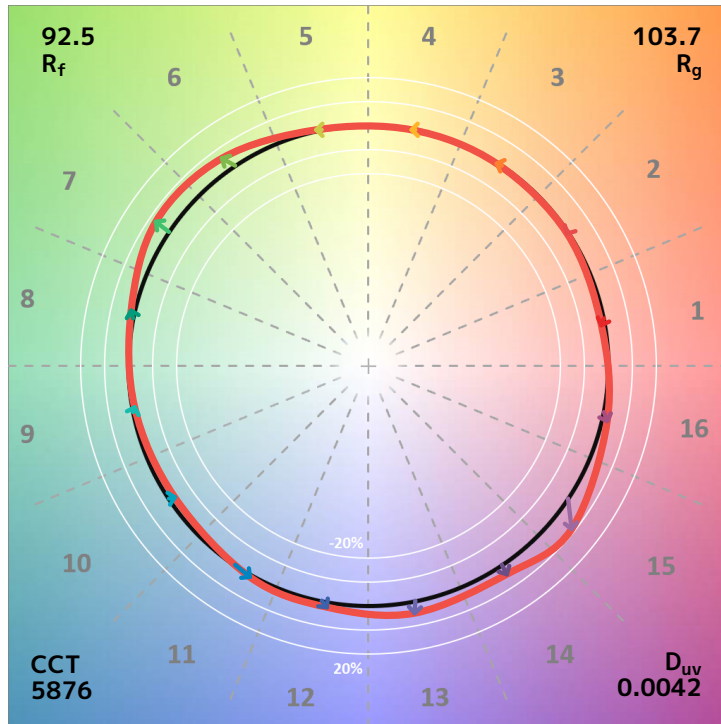


#### SSI Spectral Variance Graph- Daylight

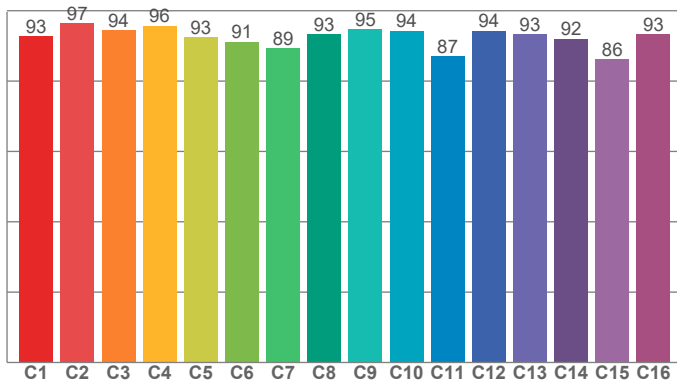
SSI [CIE D65] 59



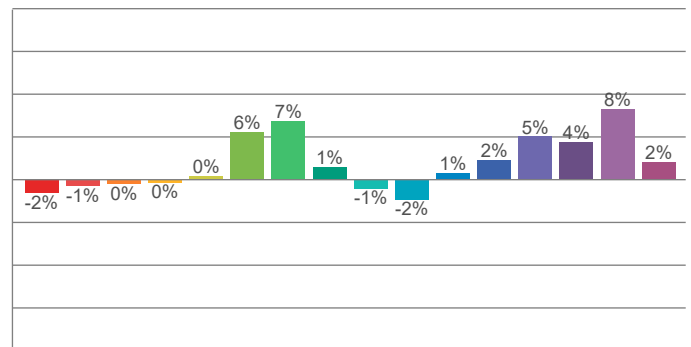




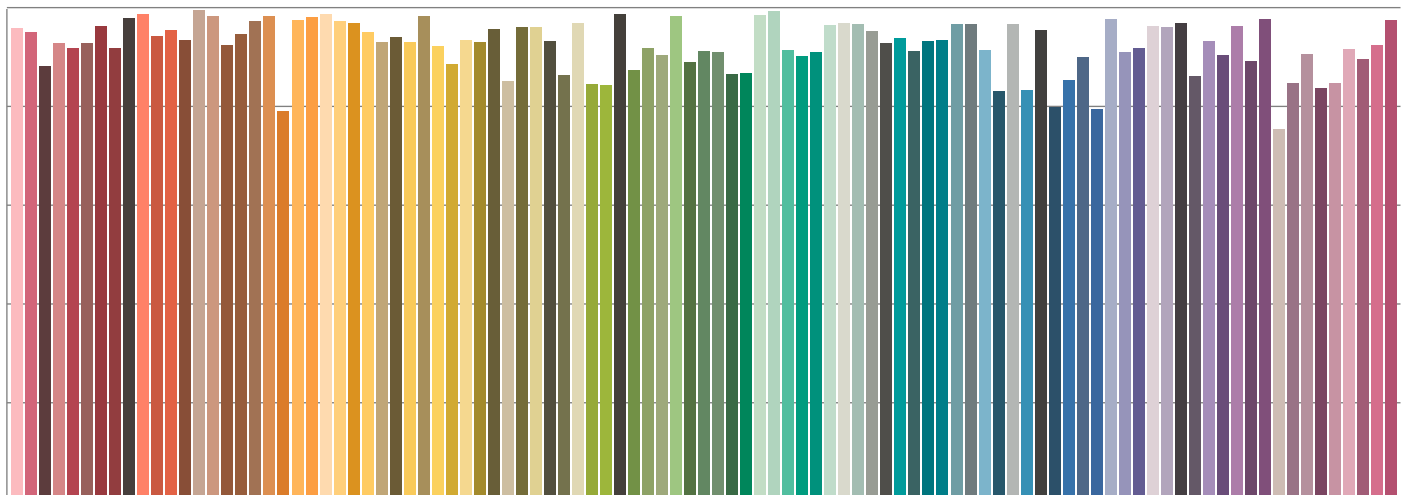
TM30-18 R<sub>f</sub> Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18 R<sub>f</sub> Values per Reference Color (CES)

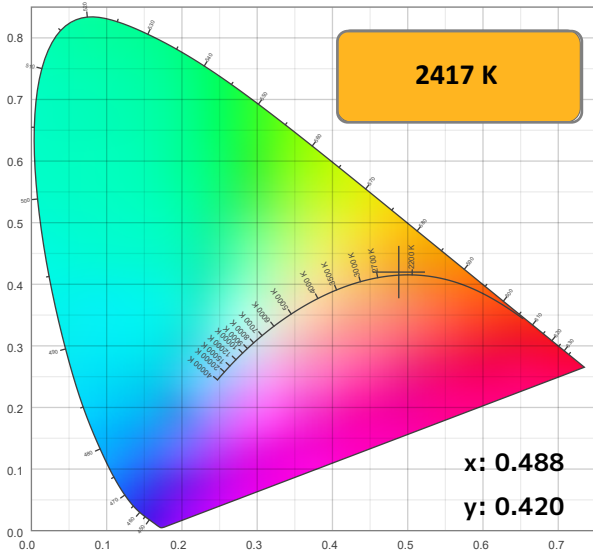


### Color Temperature: 2417K

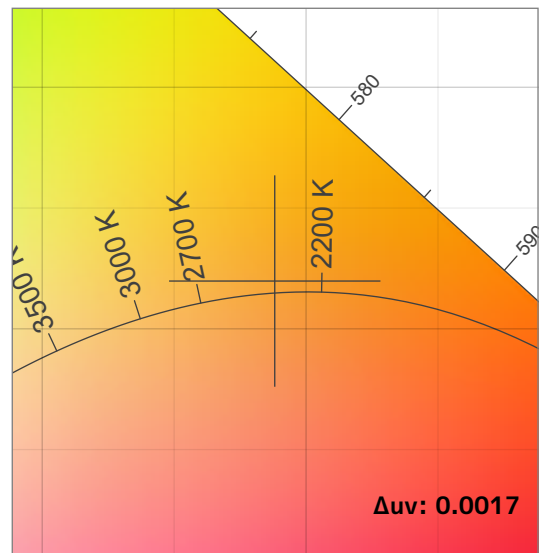
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSI <sub>t</sub>     | SSI <sub>d</sub>       |
| 96.5                  | 79.7                                      | 93.7                 | 100.8               | 82                                    | 90.4                | 0.488                      | 0.420                      | 0.0017                          | 66                   | 13                     |

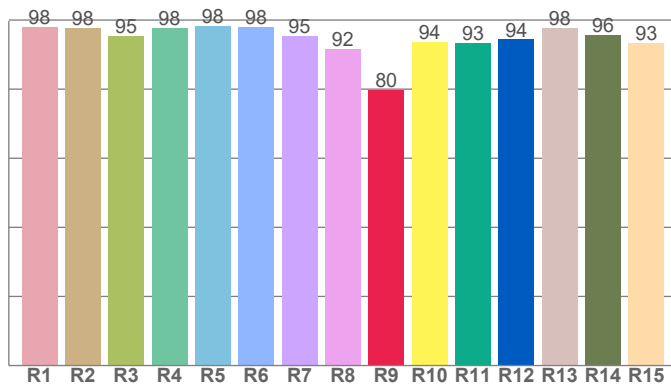
#### CIE 1931



#### CIE 1931 ZOOMED

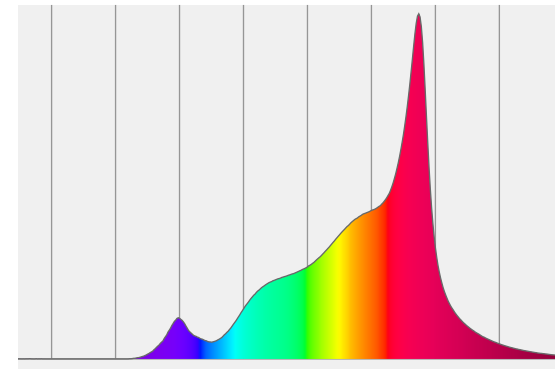


#### CRI: 96.5 (R1-R8)



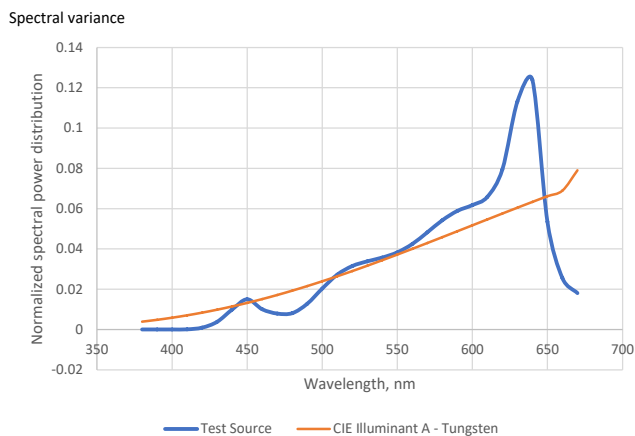
#### Spectral Power Distribution (SPD)

Dominant Wavelength 586 nm



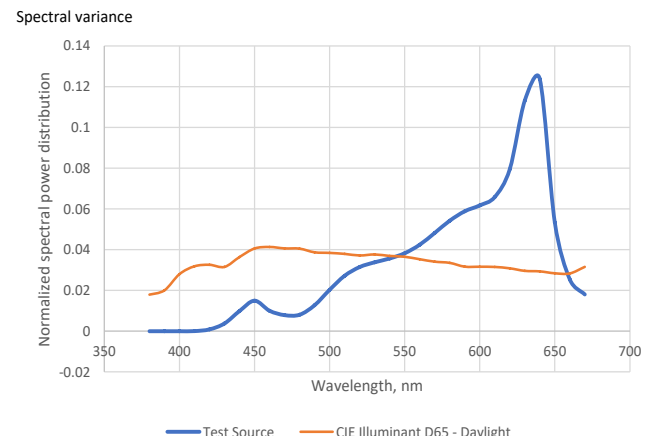
#### SSI Spectral Variance Graph- Tungsten

SSI [CIE A] 66



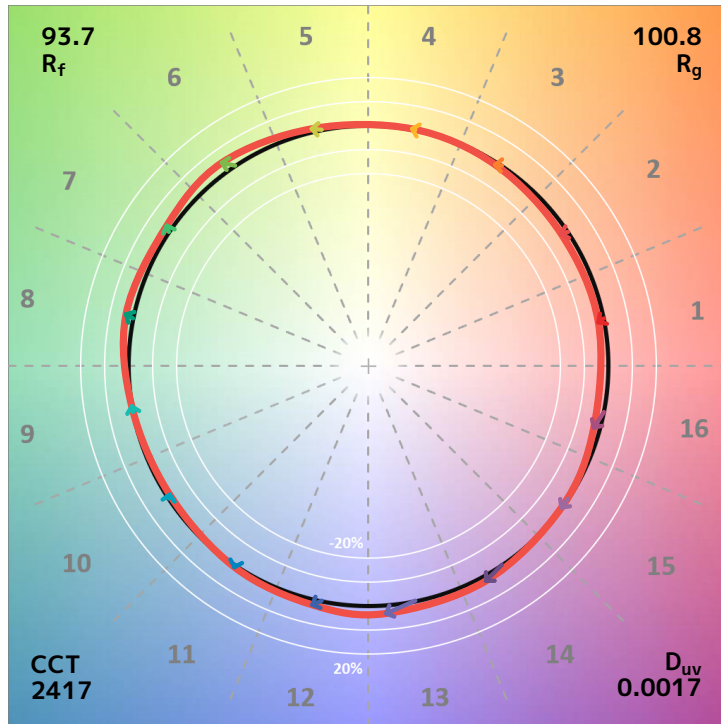
#### SSI Spectral Variance Graph- Daylight

SSI [CIE D65] 13

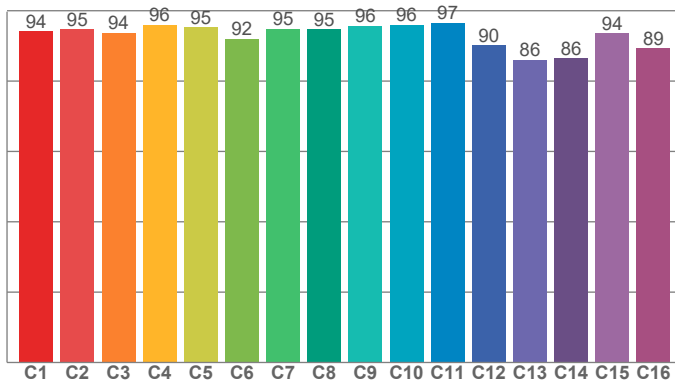


SSI [CIE D65] - Daylight

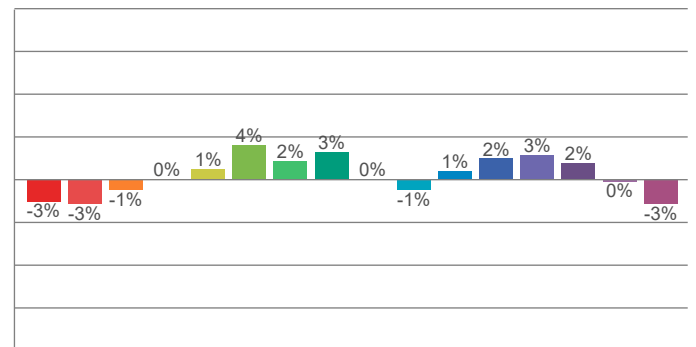
13



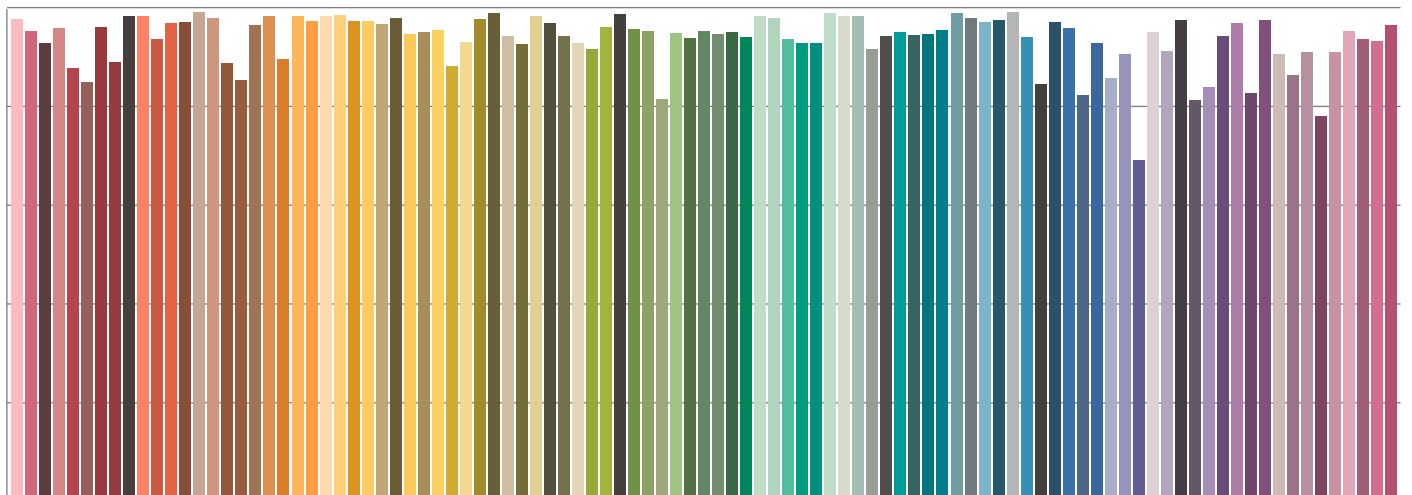
TM30-18  $R_f$  Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18  $R_f$  Values per Reference Color (CES)

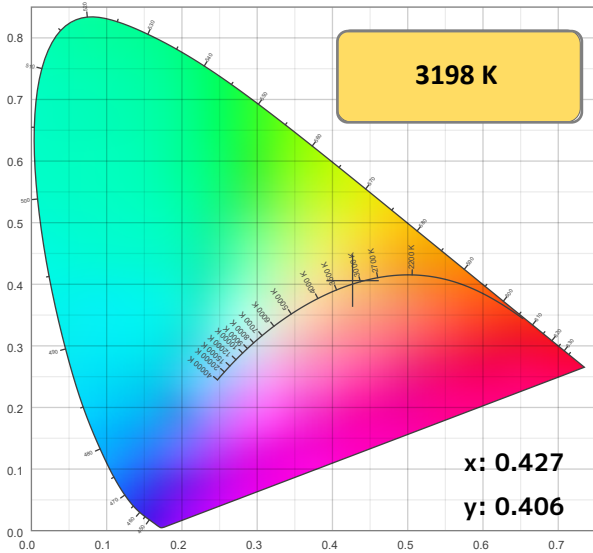


### Color Temperature: 3198K

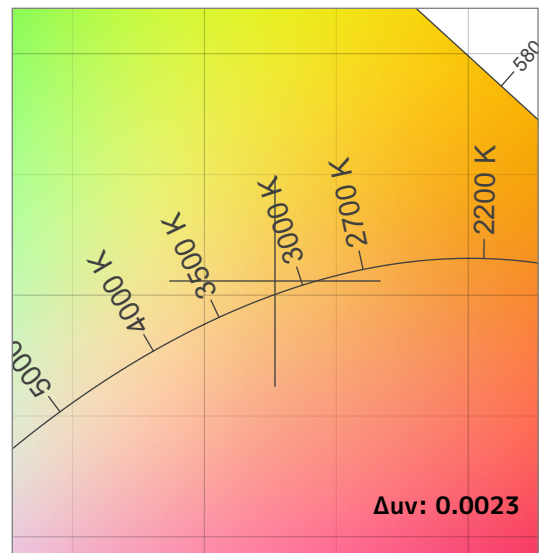
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSI <sub>t</sub>     | SSI <sub>d</sub>       |
| 96.4                  | 83.7                                      | 93.8                 | 102.6               | 87                                    | 94.2                | 0.427                      | 0.406                      | 0.0023                          | 70                   | 37                     |

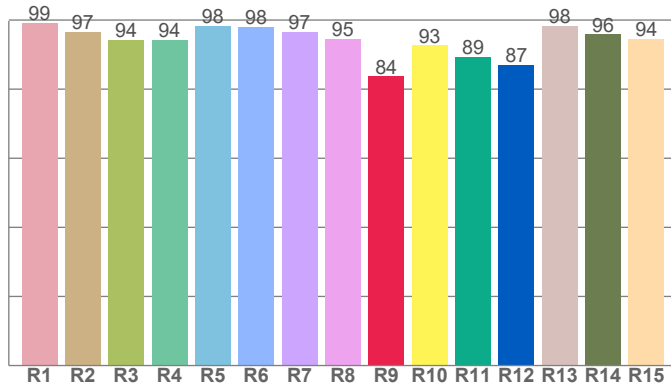
#### CIE 1931



#### CIE 1931 ZOOMED

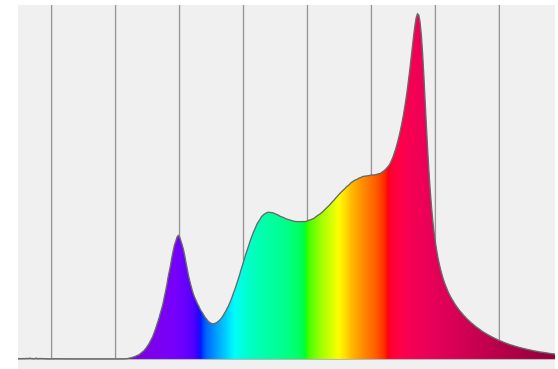


#### CRI: 96.4 (R1-R8)



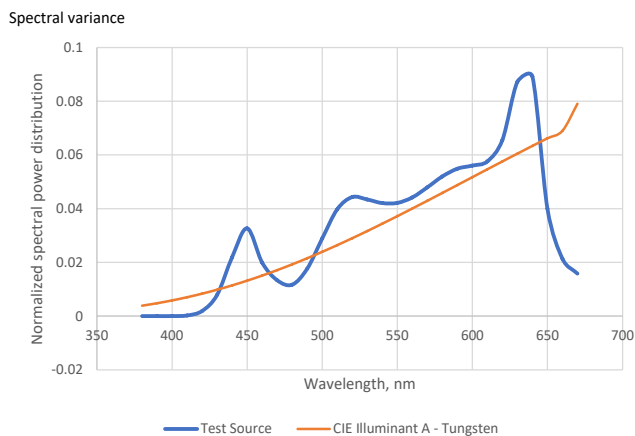
#### Spectral Power Distribution (SPD)

Dominant Wavelength 582 nm



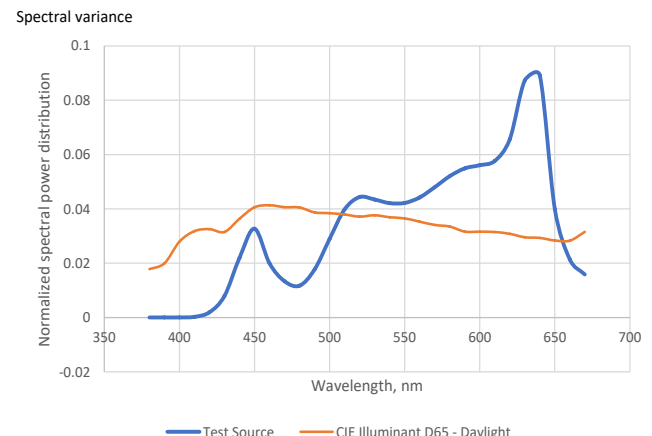
#### SSI Spectral Variance Graph- Tungsten

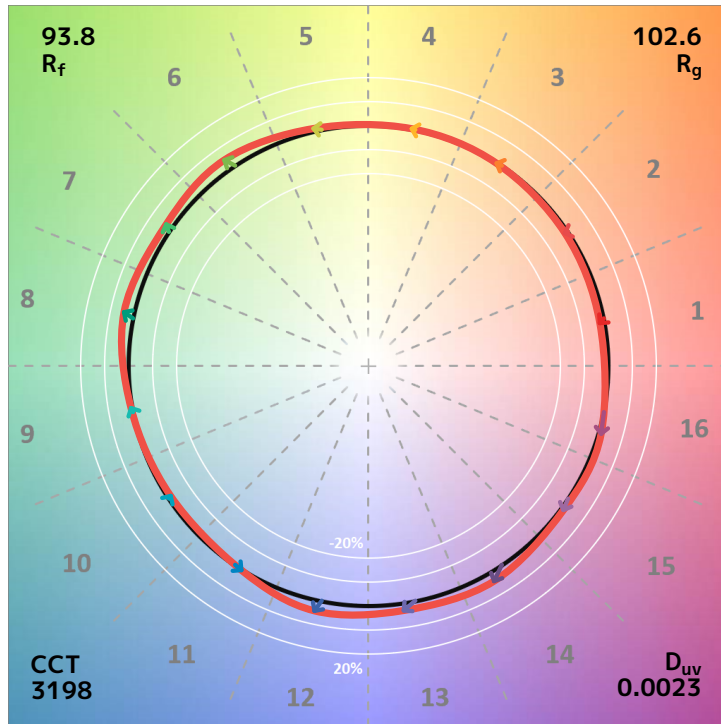
SSI [CIE A] 70



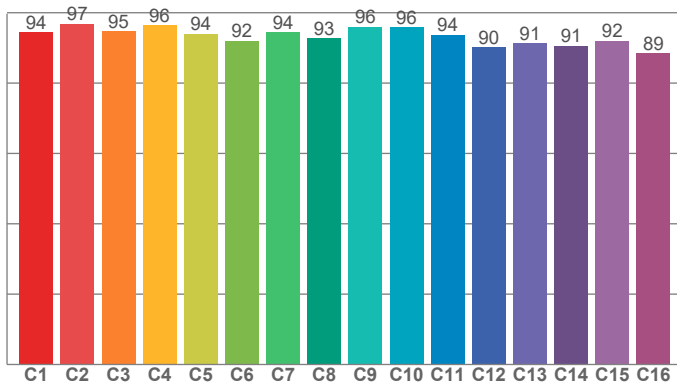
#### SSI Spectral Variance Graph- Daylight

SSI [CIE D65] 37

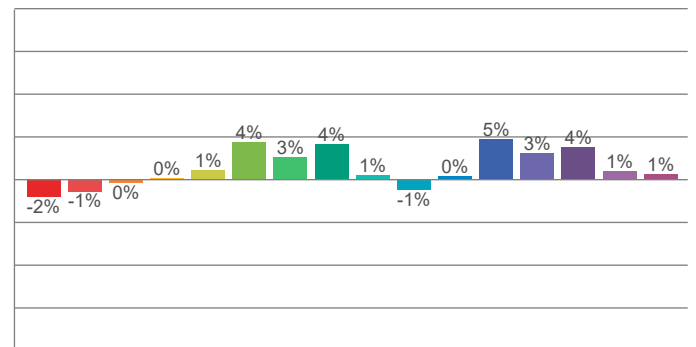




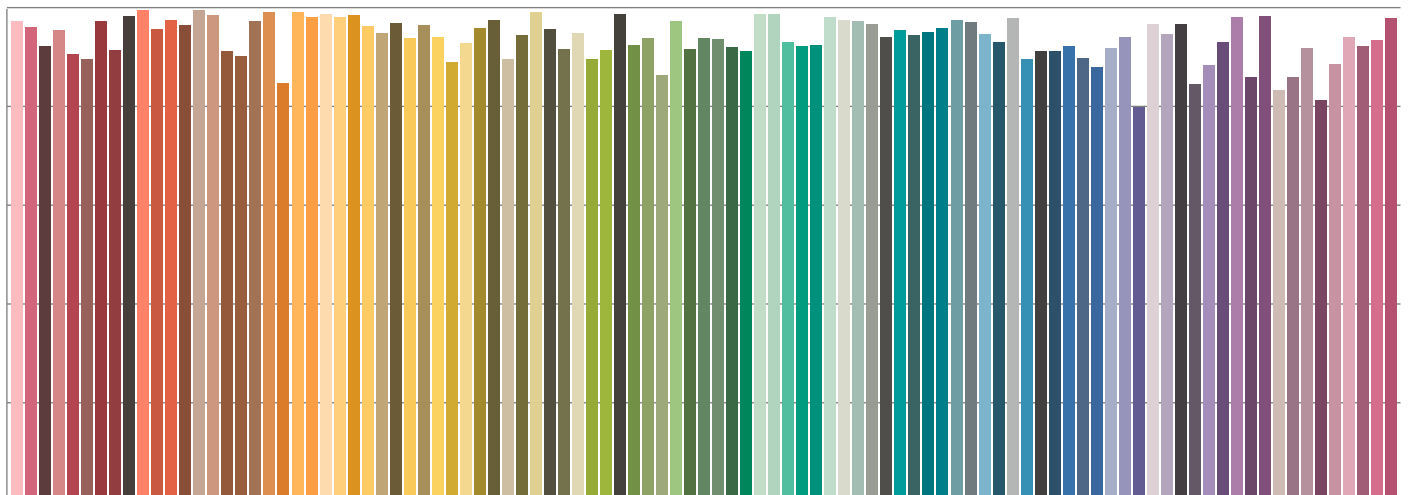
TM30-18  $R_f$  Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18  $R_f$  Values per Reference Color (CES)

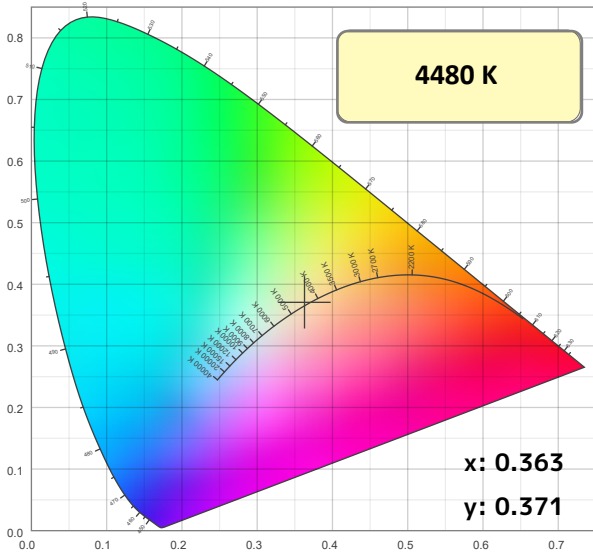


### Color Temperature: 4480K

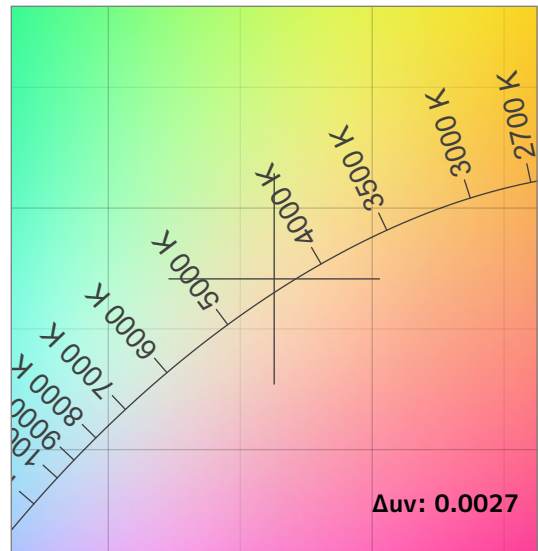
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSIt                 | SSId                   |
| 95.6                  | 88.9                                      | 93.1                 | 104.3               | 86                                    | 95.4                | 0.363                      | 0.371                      | 0.0027                          | 50                   | 55                     |

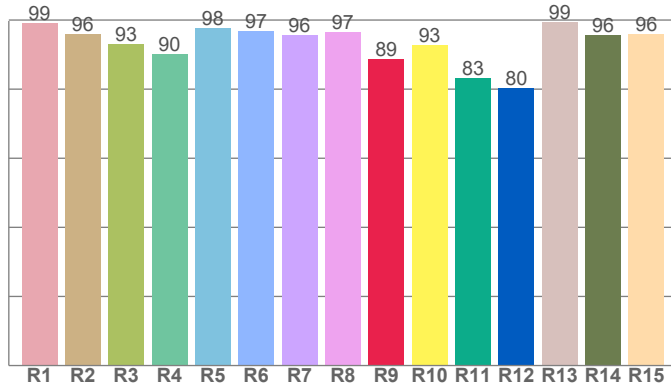
**CIE 1931**



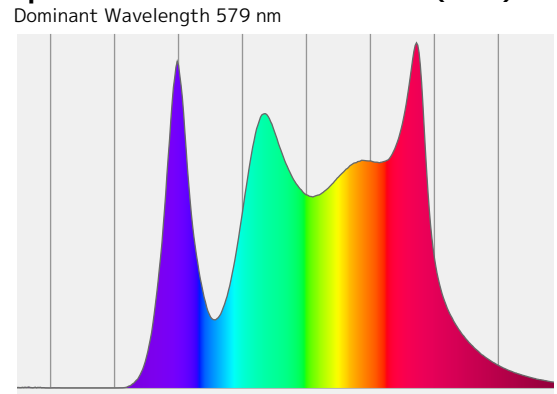
**CIE 1931 ZOOMED**



**CRI: 95.6 (R1-R8)**

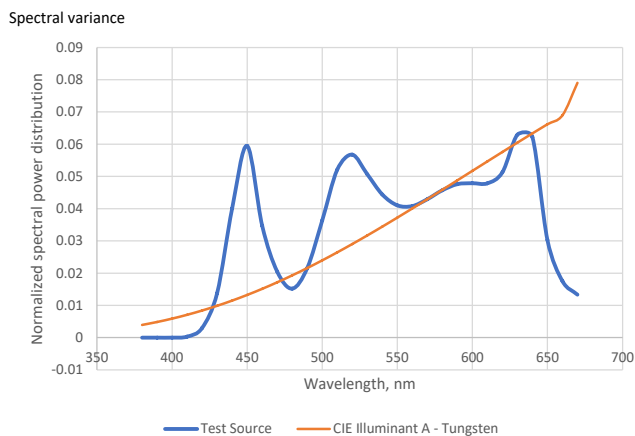


**Spectral Power Distribution (SPD)**



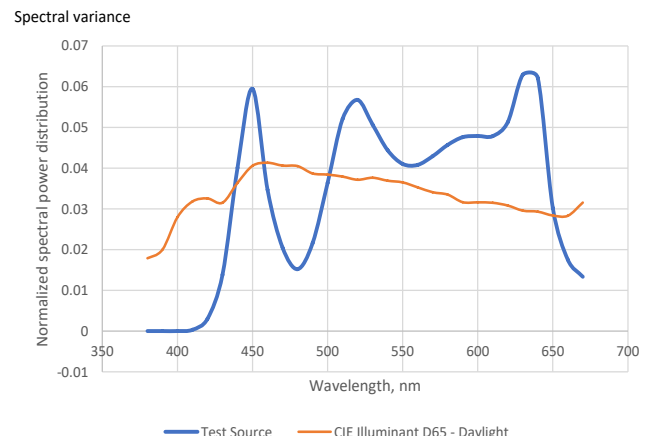
**SSI Spectral Variance Graph- Tungsten**

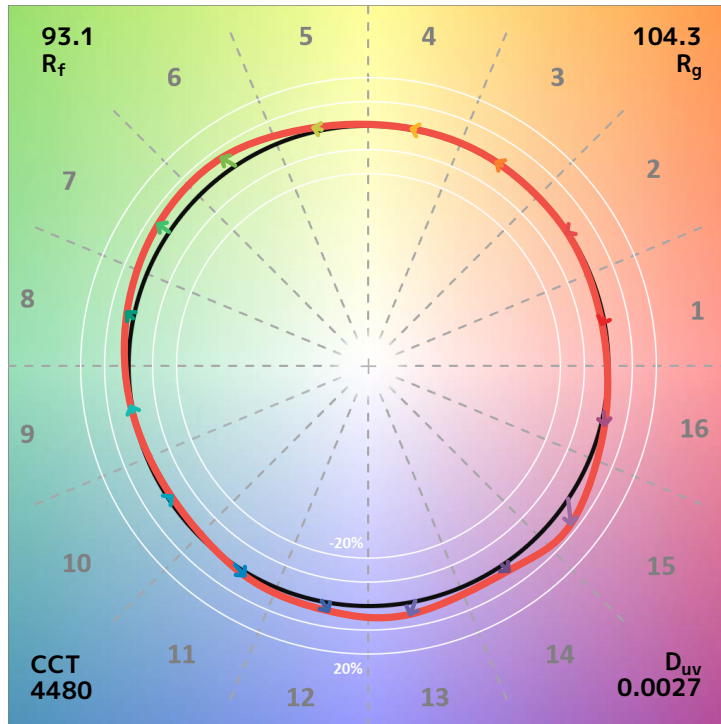
SSI [CIE A] 50



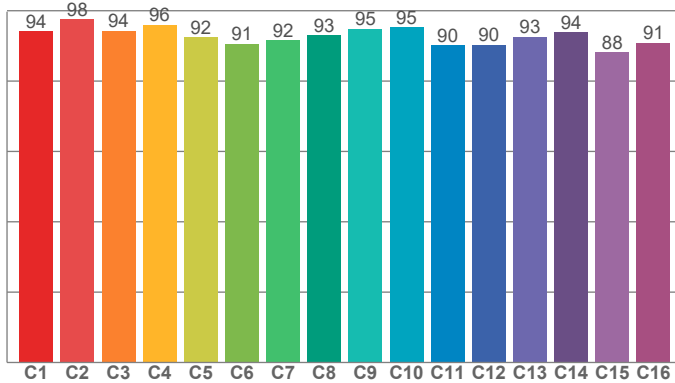
**SSI Spectral Variance Graph- Daylight**

SSI [CIE D65] 55

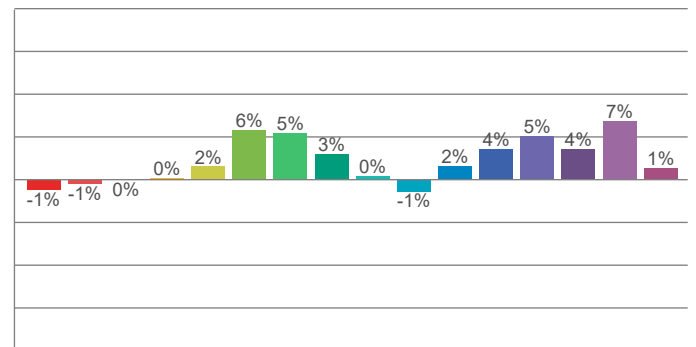




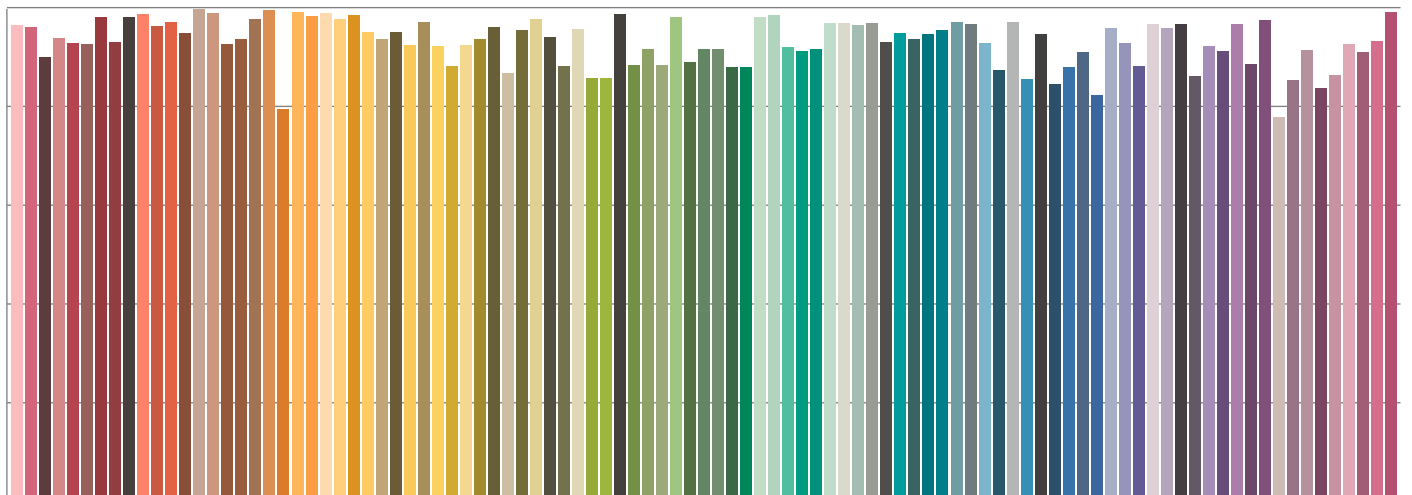
**TM30-18  $R_f$  Values per Hue Bin**



**TM30 Chroma Shift per Hue Bin**



**TM30-18  $R_f$  Values per Reference Color (CES)**

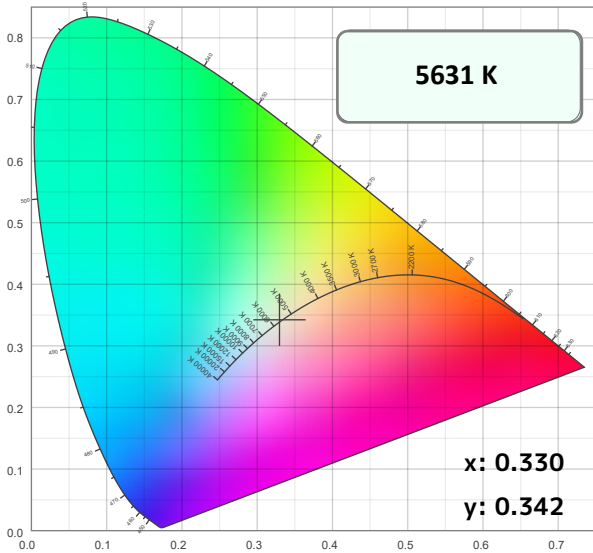


### Color Temperature: 5631K

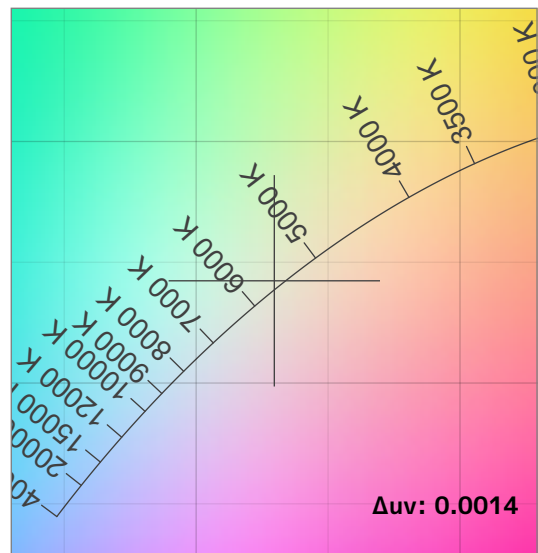
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSIt                 | SSId                   |
| 94.0                  | 83.6                                      | 91.9                 | 104.8               | 88                                    | 94.1                | 0.330                      | 0.342                      | 0.0014                          | 33                   | 59                     |

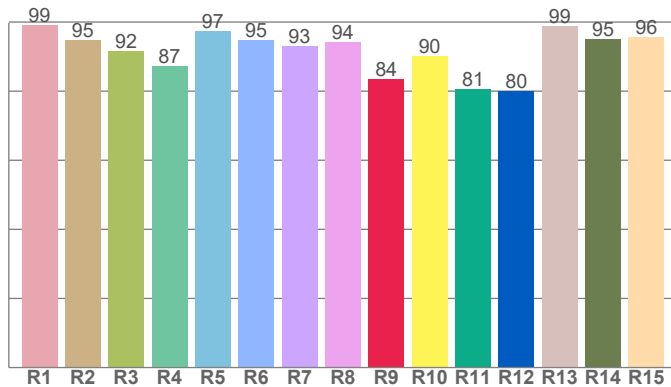
#### CIE 1931



#### CIE 1931 ZOOMED

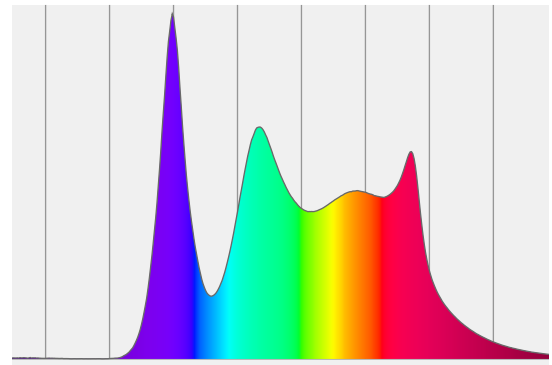


#### CRI: 94.0 (R1-R8)



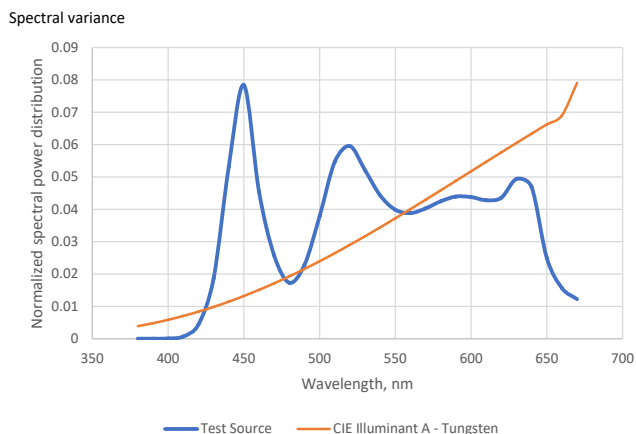
#### Spectral Power Distribution (SPD)

Dominant Wavelength 580 nm



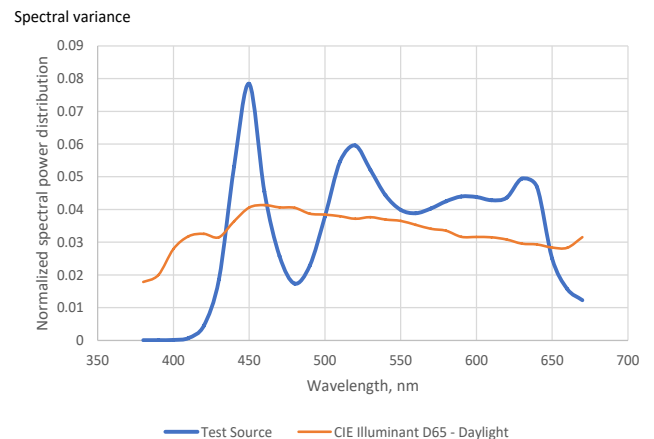
#### SSI Spectral Variance Graph- Tungsten

SSI [CIE A] 33

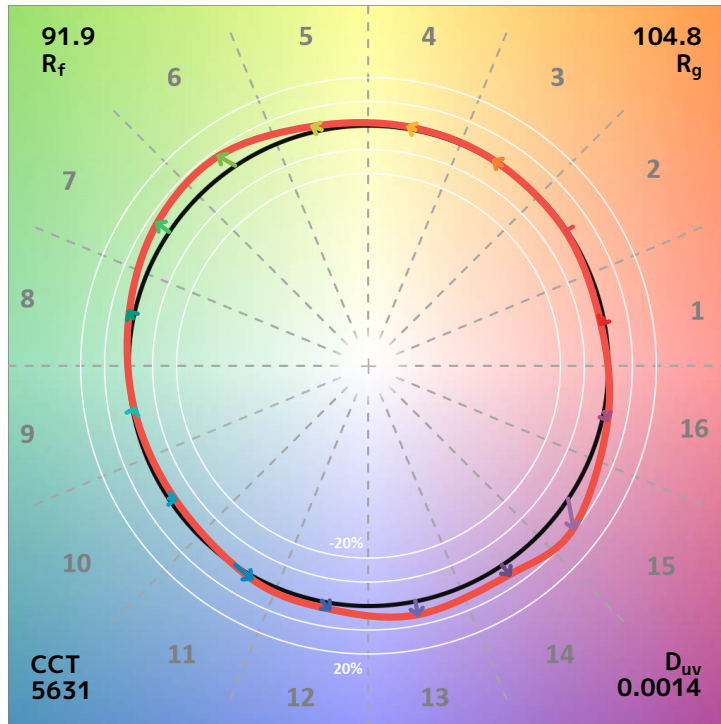


#### SSI Spectral Variance Graph- Daylight

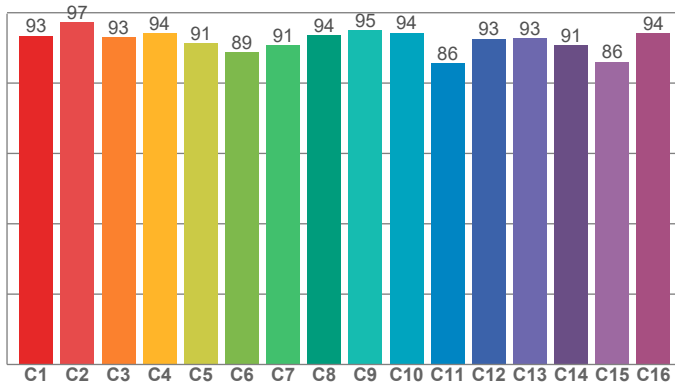
SSI [CIE D65] 59



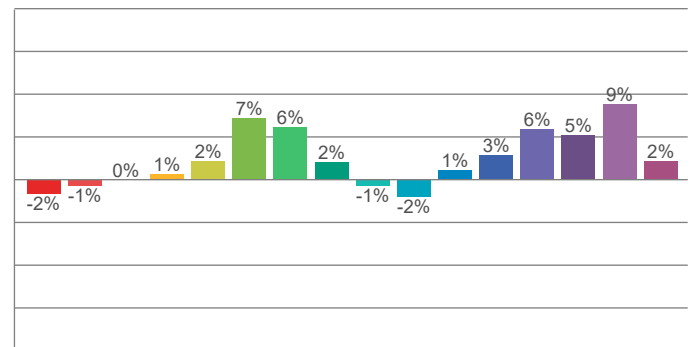




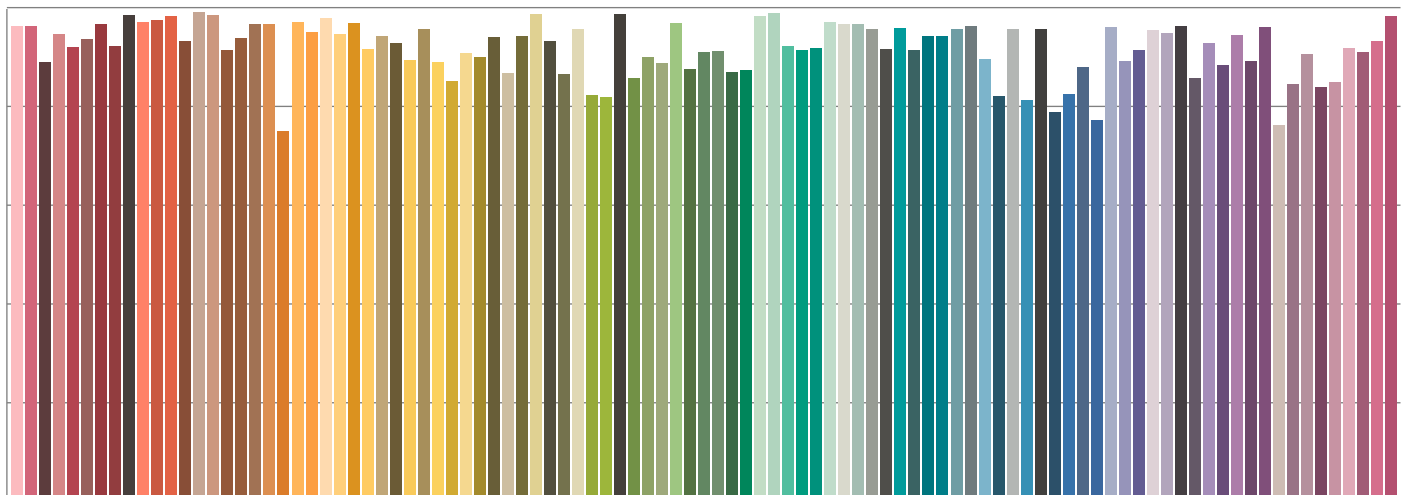
TM30-18 R<sub>f</sub> Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18 R<sub>f</sub> Values per Reference Color (CES)

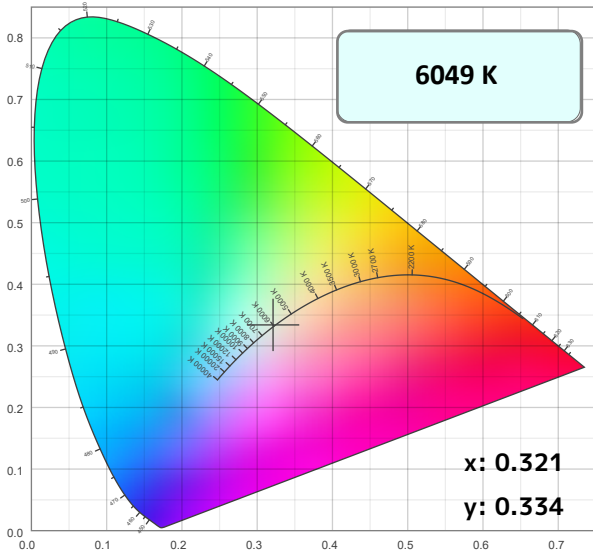


### Color Temperature: 6049K

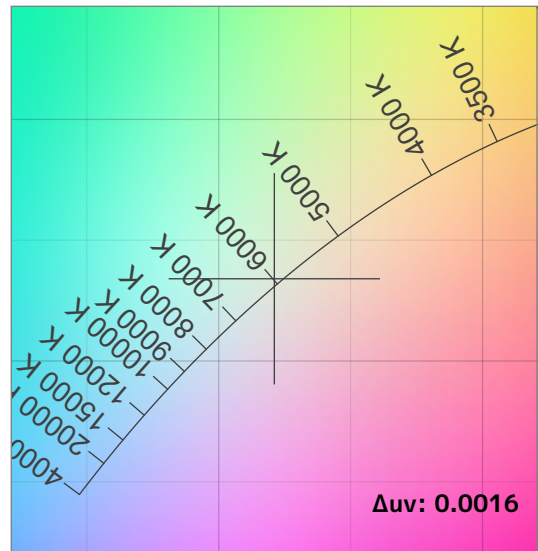
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSI <sub>t</sub>     | SSI <sub>d</sub>       |
| 93.8                  | 84.2                                      | 91.7                 | 104.9               | 88                                    | 94.0                | 0.321                      | 0.334                      | 0.0016                          | 28                   | 59                     |

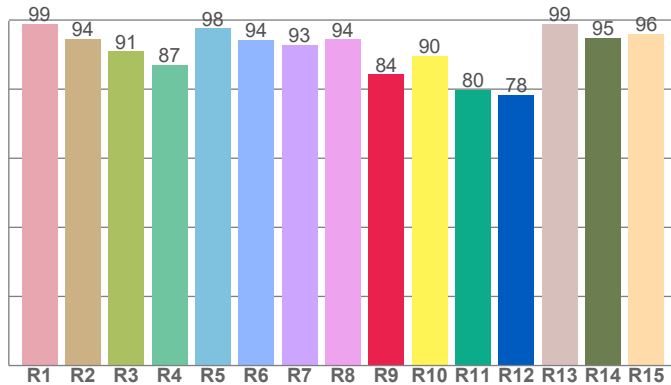
#### CIE 1931



#### CIE 1931 ZOOMED

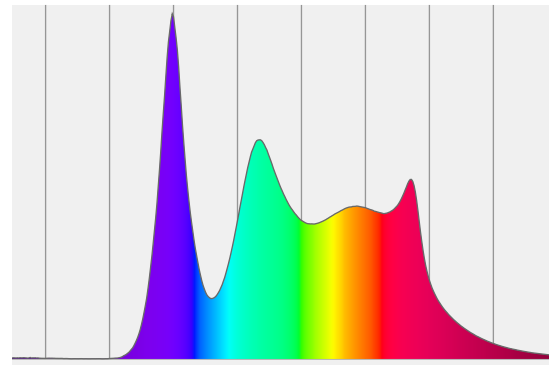


#### CRI: 93.8 (R1-R8)



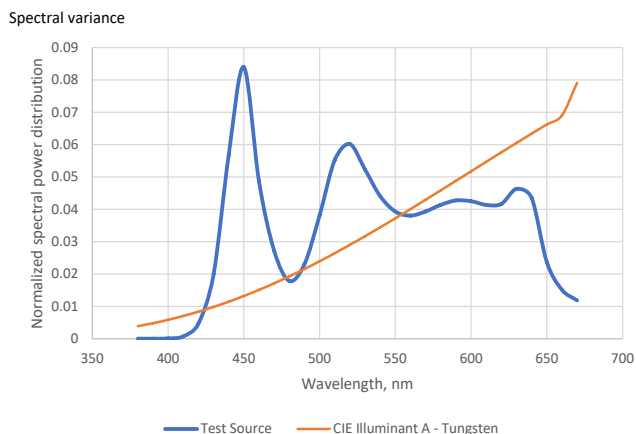
#### Spectral Power Distribution (SPD)

Dominant Wavelength 584 nm



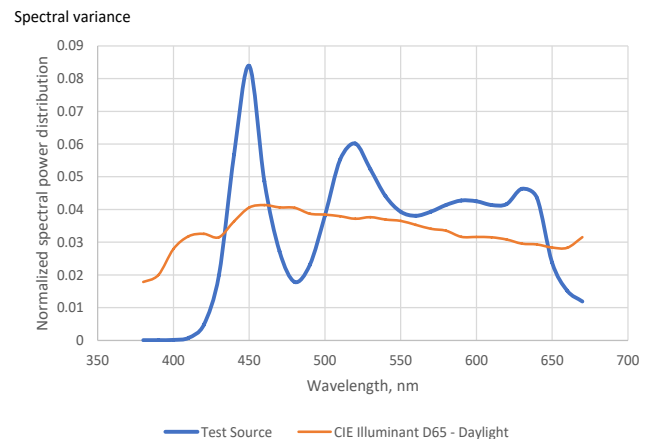
#### SSI Spectral Variance Graph- Tungsten

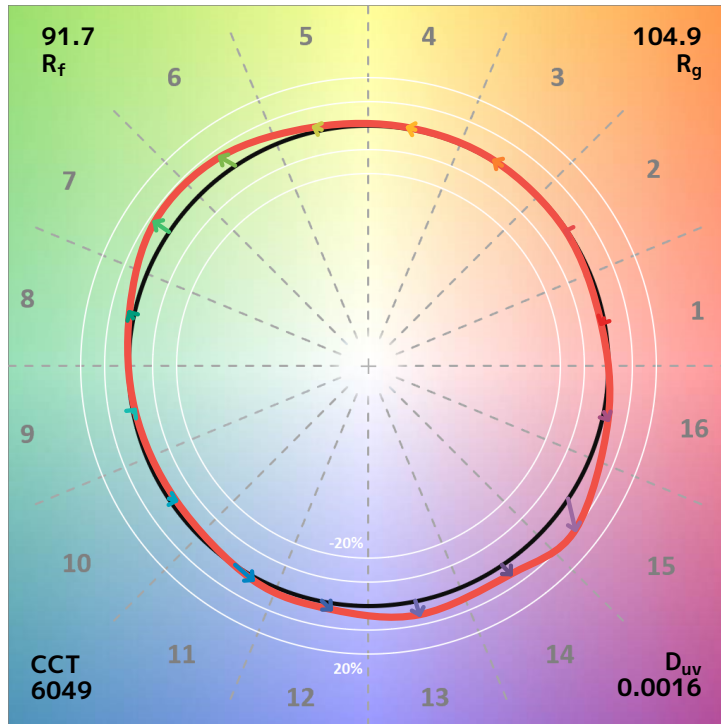
SSI [CIE A] 28



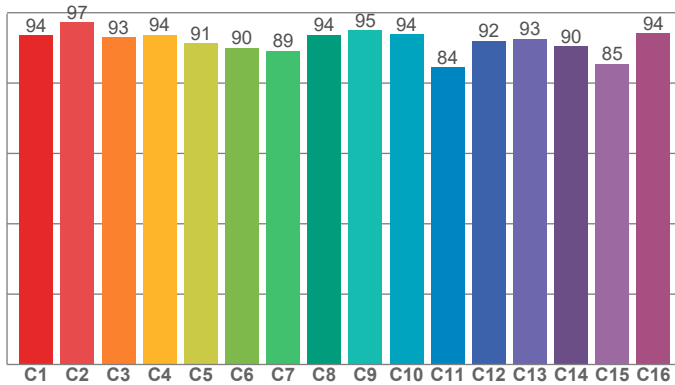
#### SSI Spectral Variance Graph- Daylight

SSI [CIE D65] 59

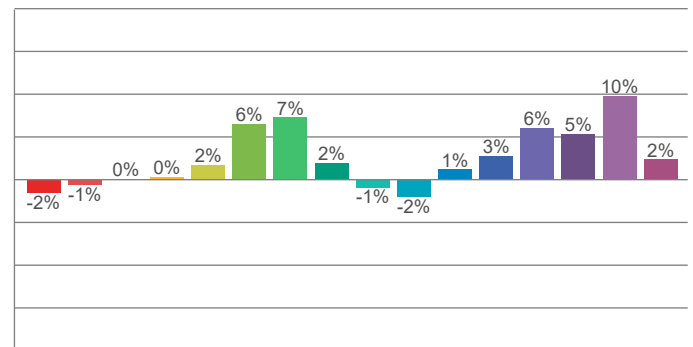




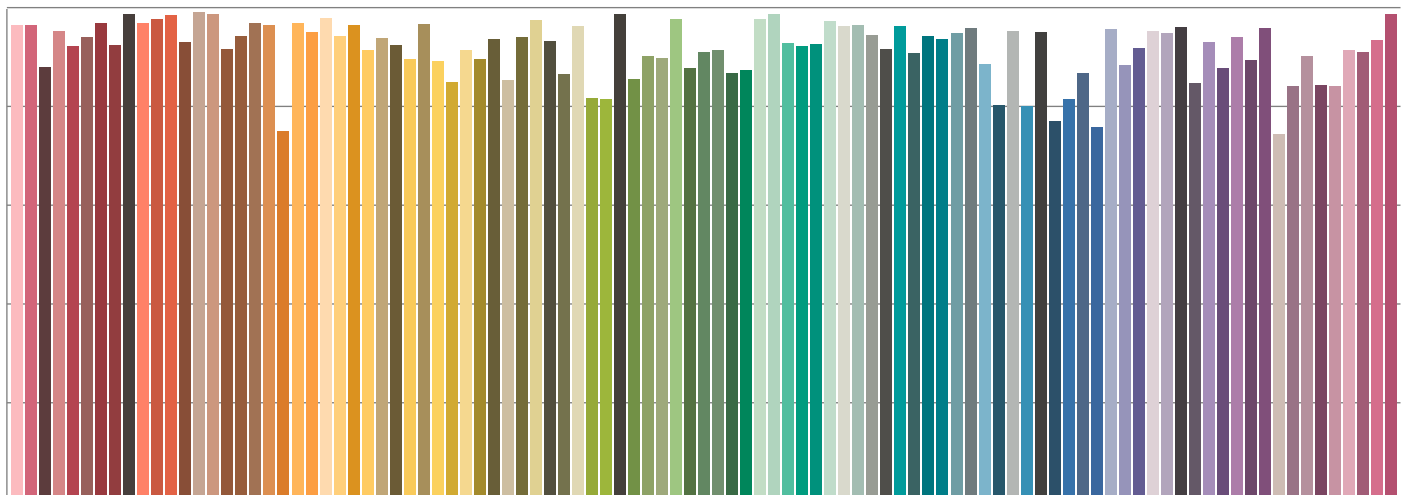
TM30-18 R<sub>f</sub> Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18 R<sub>f</sub> Values per Reference Color (CES)

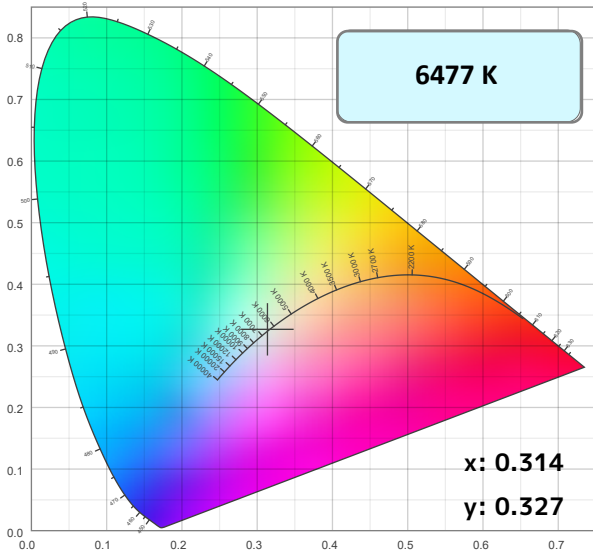


### Color Temperature: 6477K

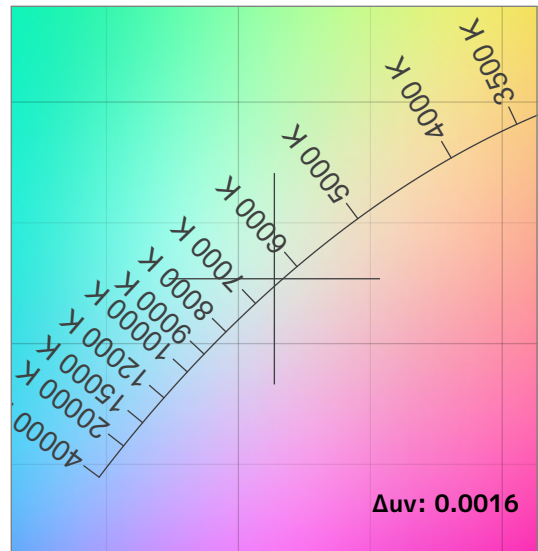
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSI <sub>t</sub>     | SSI <sub>d</sub>       |
| 93.6                  | 87.4                                      | 91.7                 | 104.9               | 88                                    | 94.1                | 0.314                      | 0.327                      | 0.0016                          | 23                   | 58                     |

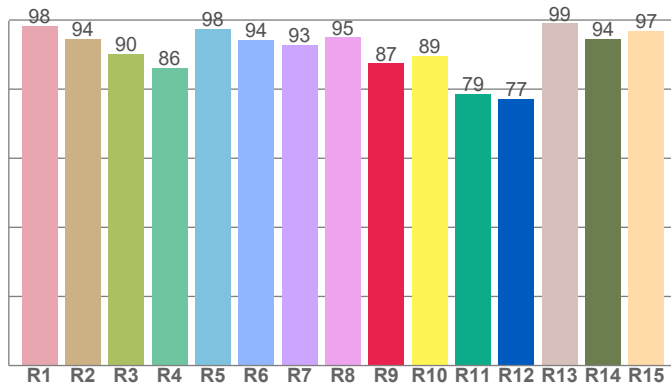
#### CIE 1931



#### CIE 1931 ZOOMED

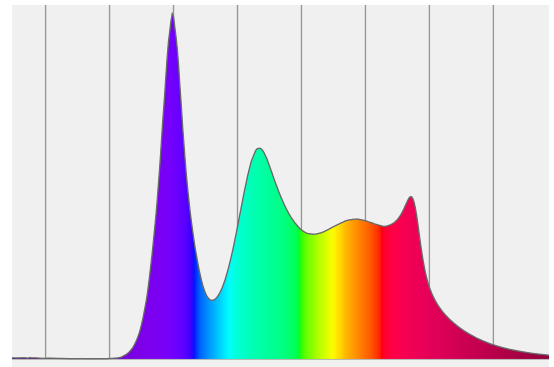


#### CRI: 93.6 (R1-R8)



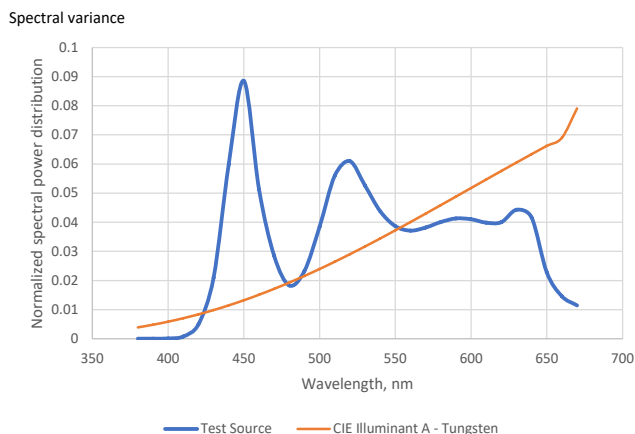
#### Spectral Power Distribution (SPD)

Dominant Wavelength 360 nm



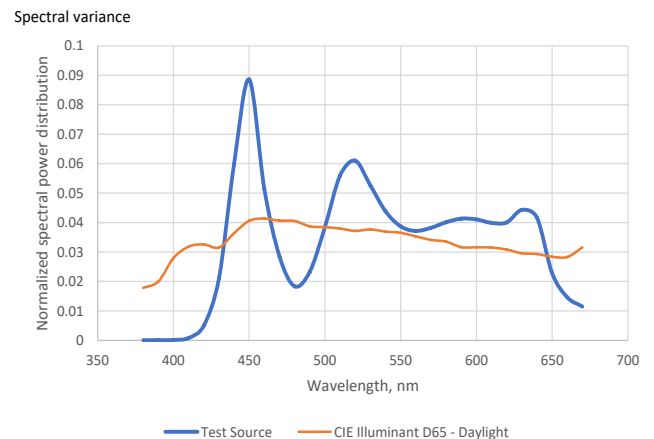
#### SSI Spectral Variance Graph- Tungsten

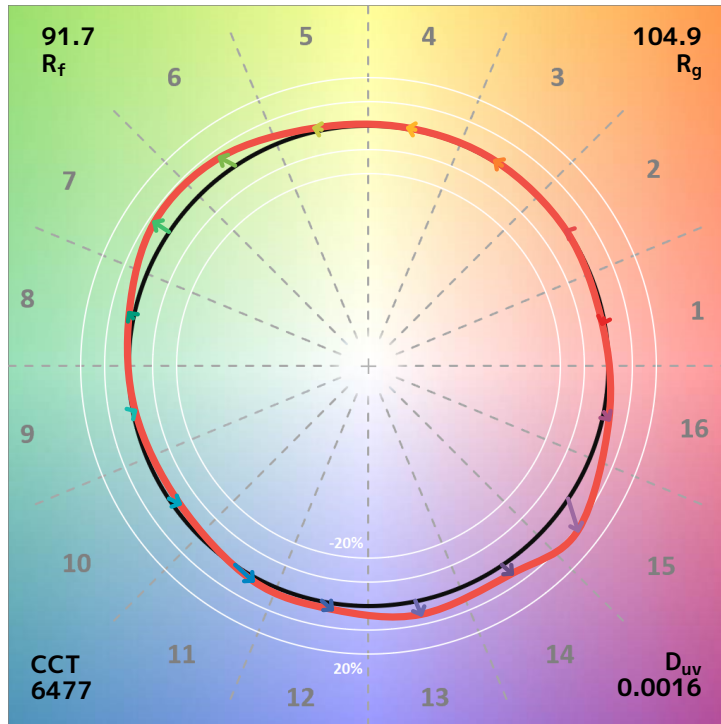
SSI [CIE A] 23



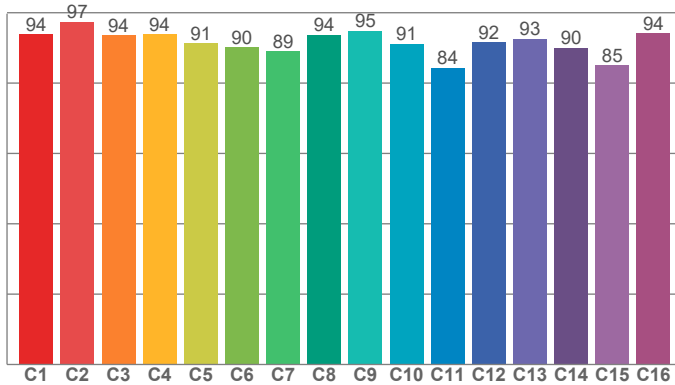
#### SSI Spectral Variance Graph- Daylight

SSI [CIE D65] 58

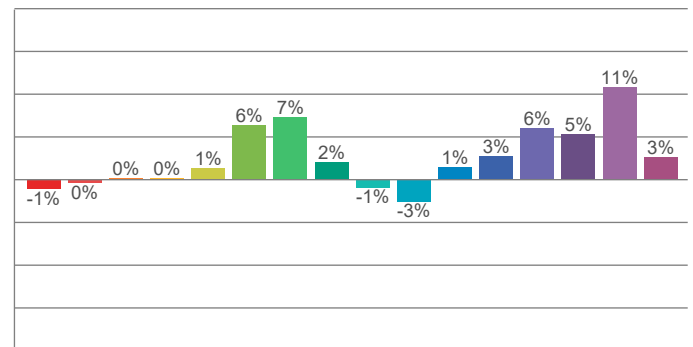




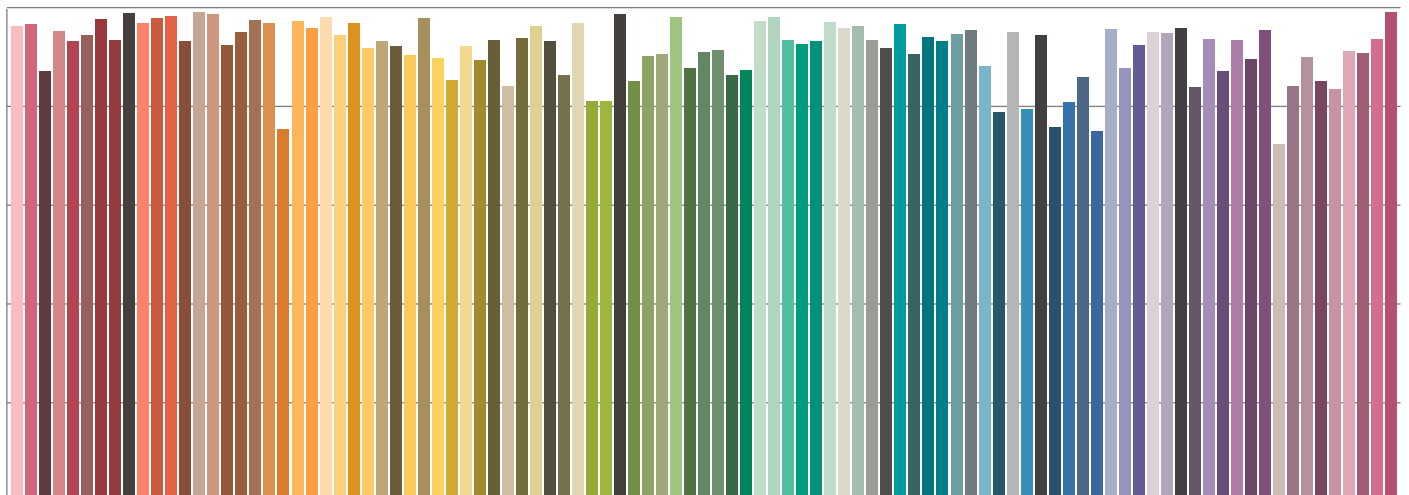
TM30-18  $R_f$  Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18  $R_f$  Values per Reference Color (CES)

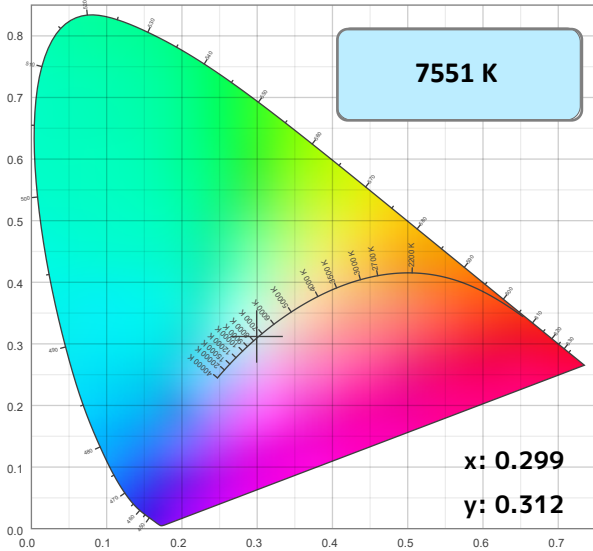


### Color Temperature: 7551K

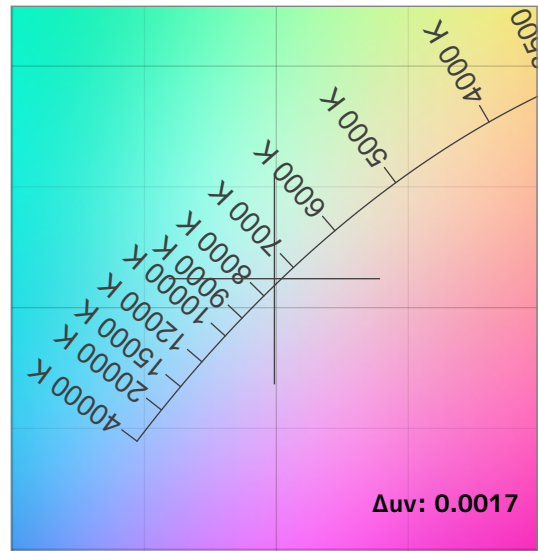
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate- CIE 1931 | Color Coordinate- CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|----------------------------|----------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                          | Y                          | Δuv                             | SSIt                 | SSId                   |
| 93.2                  | 86.3                                      | 91.1                 | 104.5               | 88                                    | 93.8                | 0.299                      | 0.312                      | 0.0017                          | 14                   | 56                     |

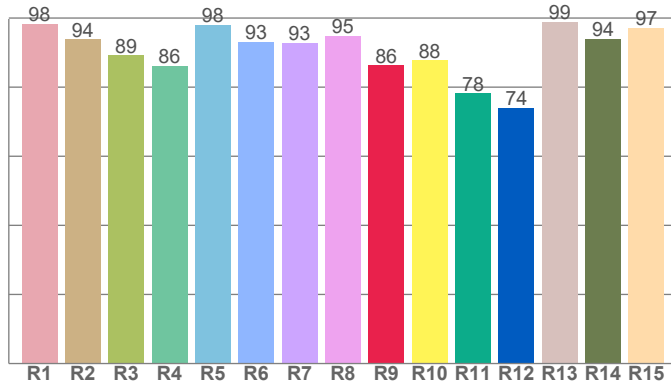
#### CIE 1931



#### CIE 1931 ZOOMED

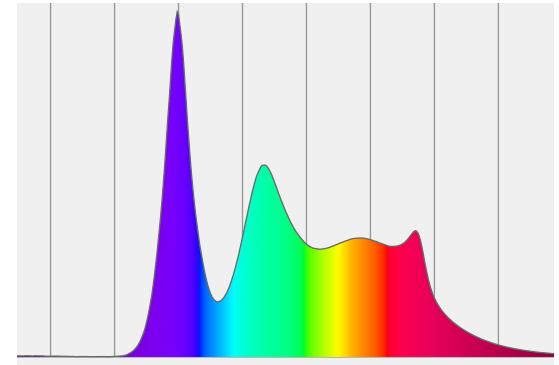


#### CRI: 93.2 (R1-R8)



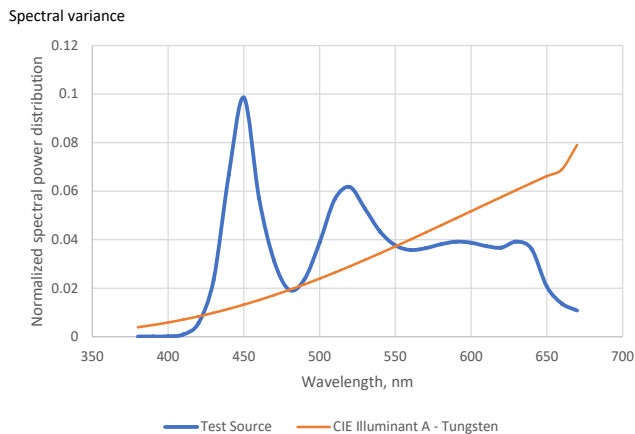
#### Spectral Power Distribution (SPD)

Dominant Wavelength 474 nm



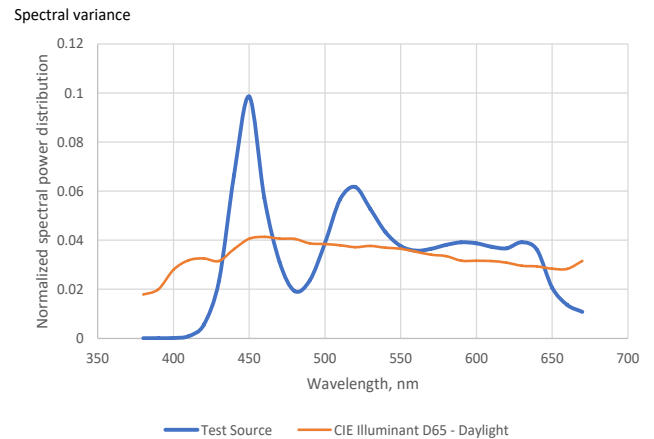
#### SSI Spectral Variance Graph- Tungsten

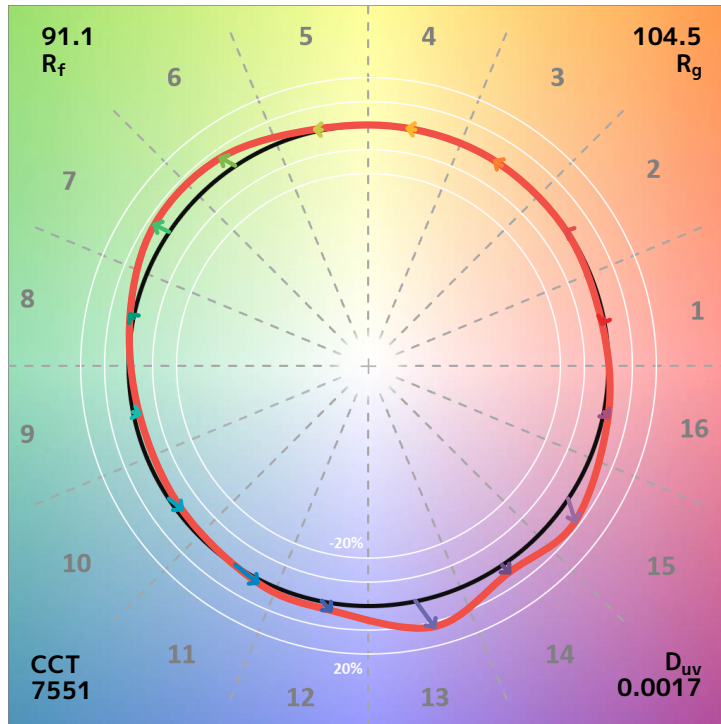
SSI [CIE A] 14



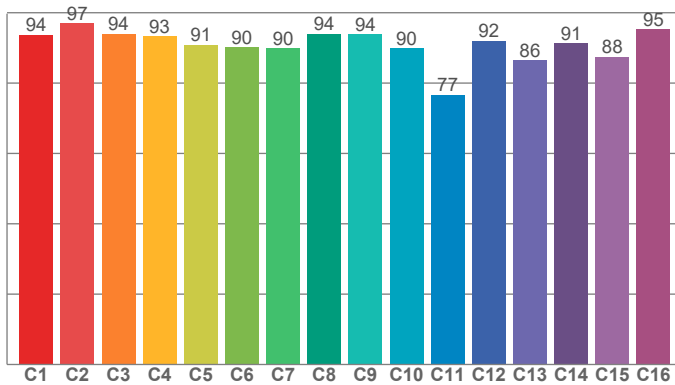
#### SSI Spectral Variance Graph- Daylight

SSI [CIE D65] 56

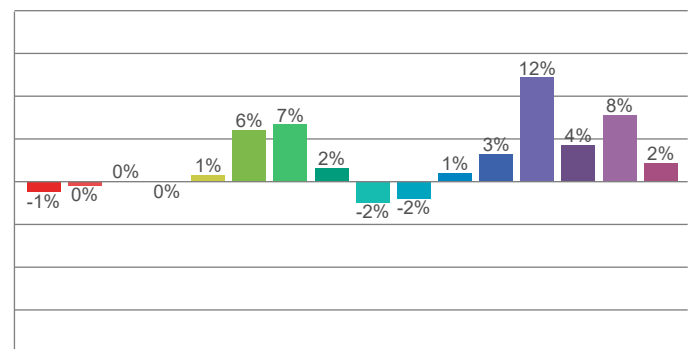




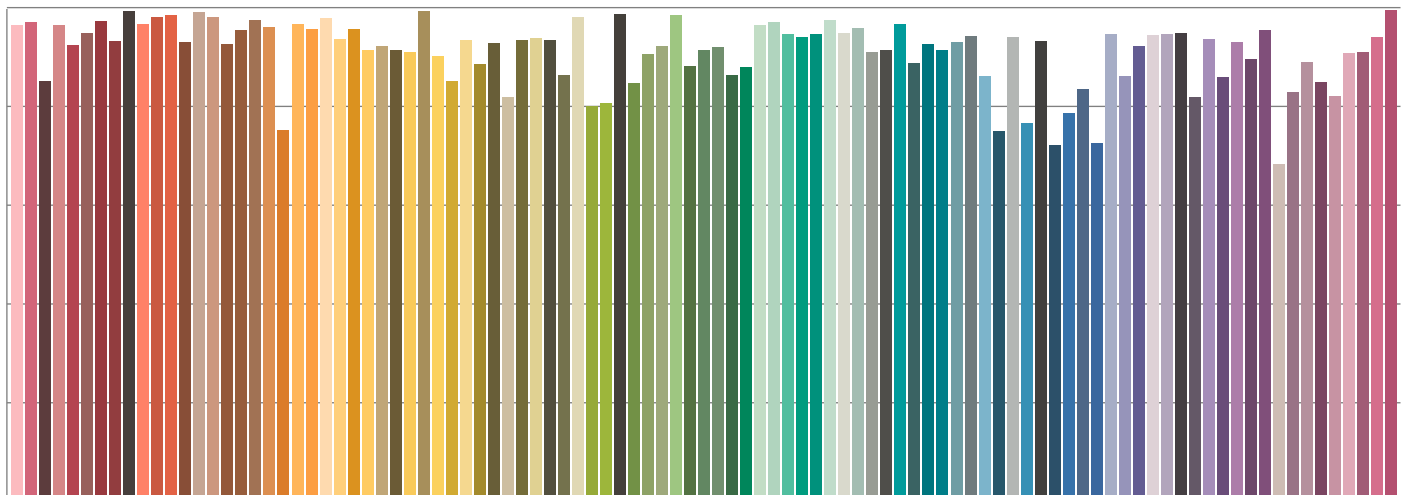
TM30-18  $R_f$  Values per Hue Bin



TM30 Chroma Shift per Hue Bin



TM30-18  $R_f$  Values per Reference Color (CES)

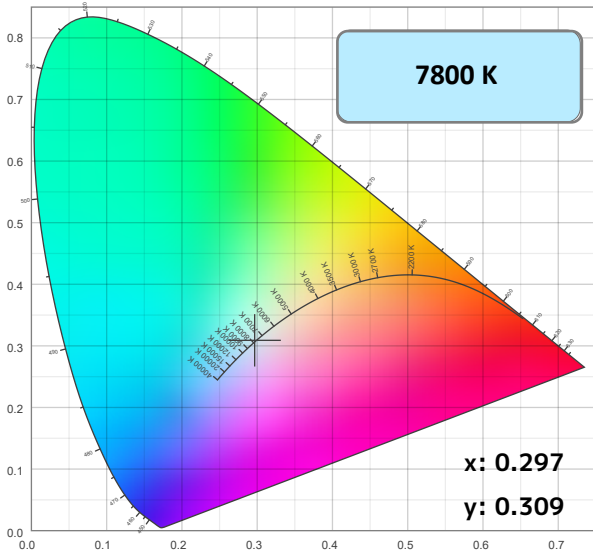


### Color Temperature: 7800K

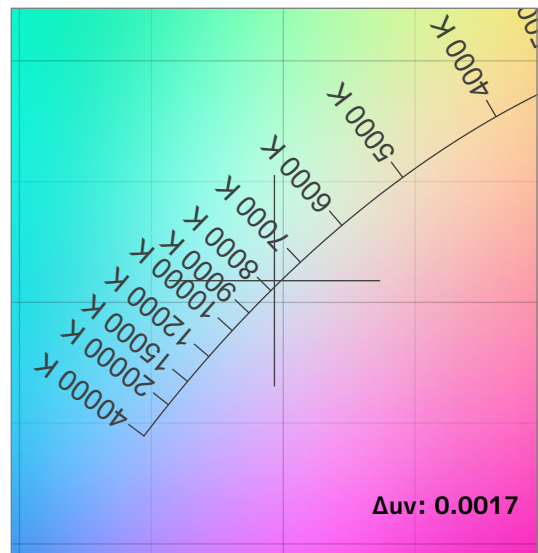
#### Accuracy Metric Overview

| Color Rendering Index | Color Rendering Index, R9 (Red Component) | TM-30 Color Fidelity | TM-30 Color Gamut   | Television Lighting Consistency Index | Color Quality Scale | Color Coordinate-CIE 1931 | Color Coordinate-CIE 1931 | Deviation from Black Body Locus | SSI [CIE A] Tungsten | SSI [CIE D65] Daylight |
|-----------------------|---|----------------------|---------------------|---------------------------------------|---------------------|---------------------------|---------------------------|---------------------------------|----------------------|------------------------|
| CRI                   | CRI R9                                    | TM30 R <sub>f</sub>  | TM30 R <sub>g</sub> | TLCI                                  | CQS                 | x                         | Y                         | Δuv                             | SSIt                 | SSId                   |
| 93.2                  | 84.2                                      | 90.9                 | 104.3               | 88                                    | 93.6                | 0.297                     | 0.309                     | 0.0017                          | 12                   | 56                     |

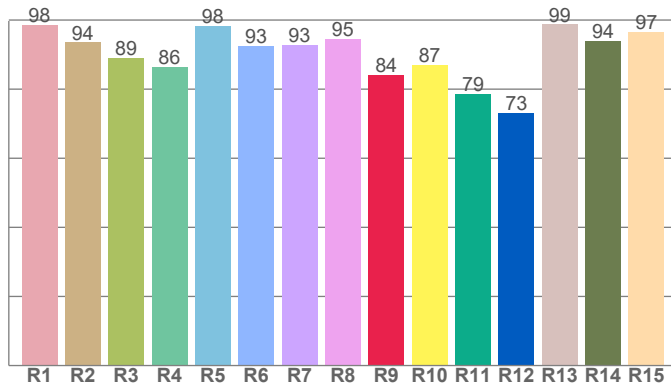
#### CIE 1931



#### CIE 1931 ZOOMED

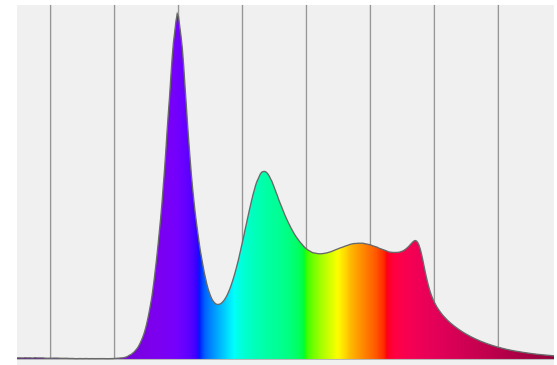


#### CRI: 93.2 (R1-R8)



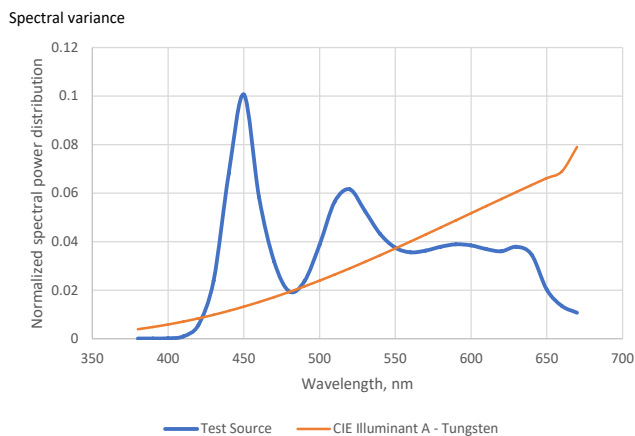
#### Spectral Power Distribution (SPD)

Dominant Wavelength 474 nm



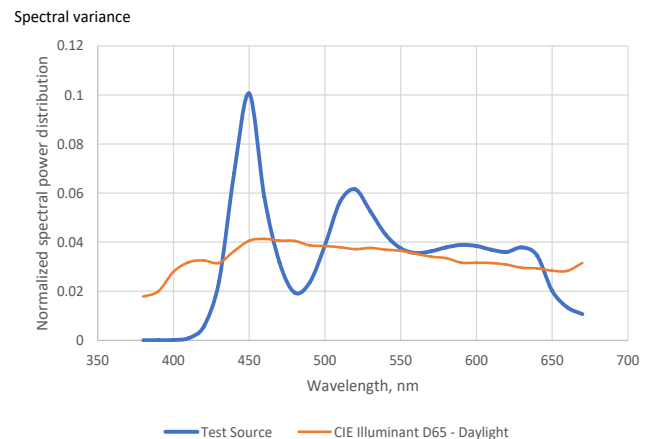
#### SSI Spectral Variance Graph- Tungsten

SSI [CIE A] 12

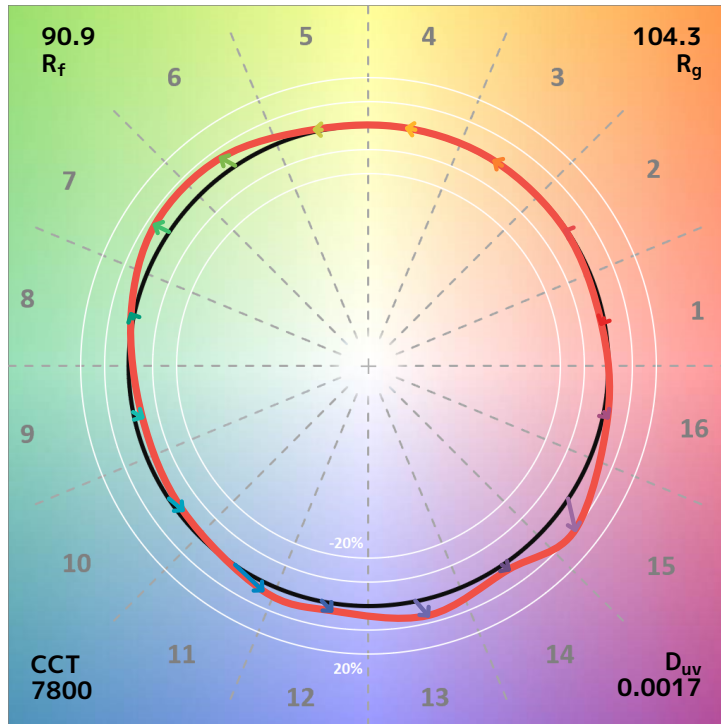


#### SSI Spectral Variance Graph- Daylight

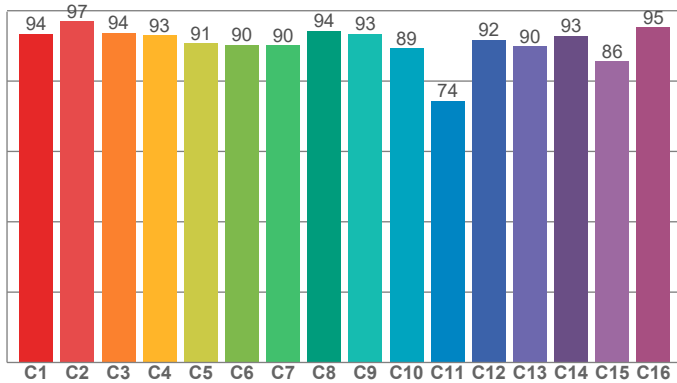
SSI [CIE D65] 56



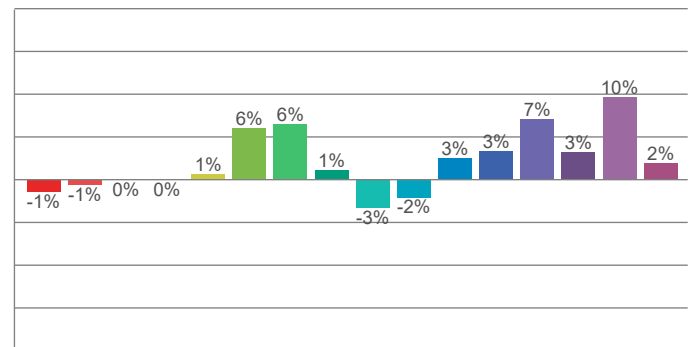




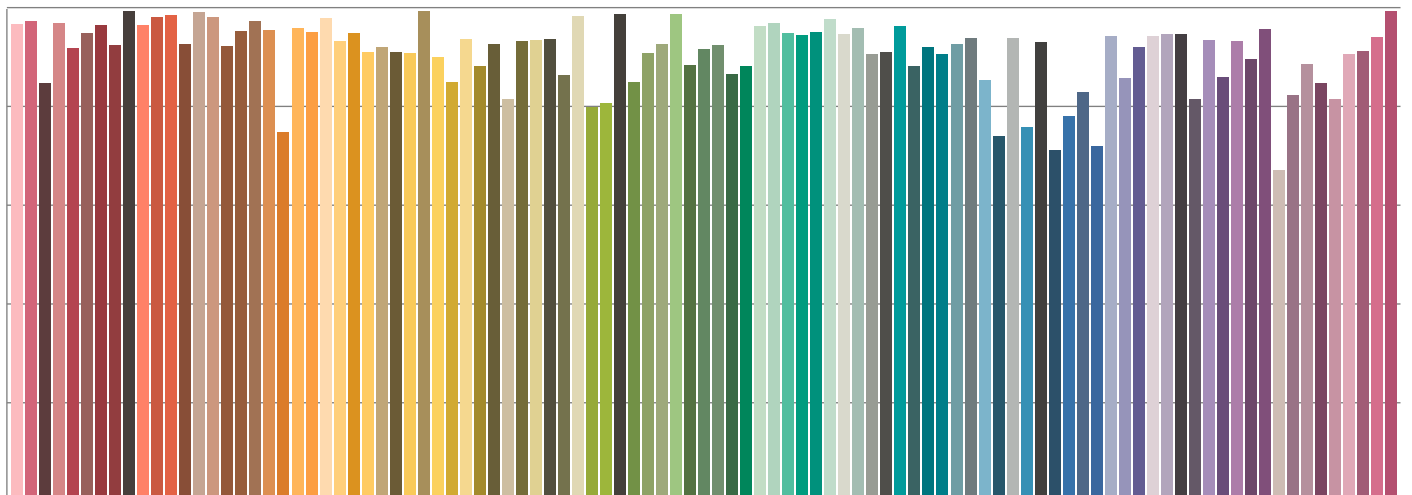
TM30-18  $R_f$  Values per Hue Bin



TM30 Chroma Shift per Hue Bin

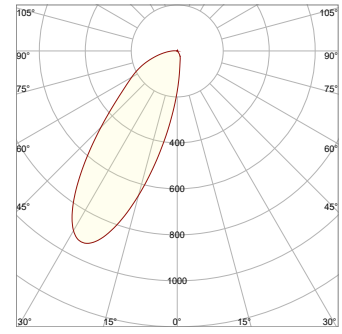
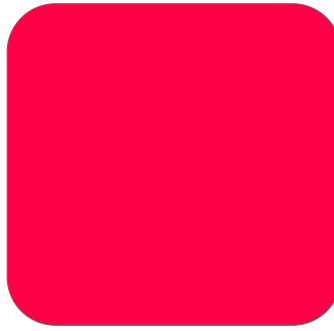


TM30-18  $R_f$  Values per Reference Color (CES)

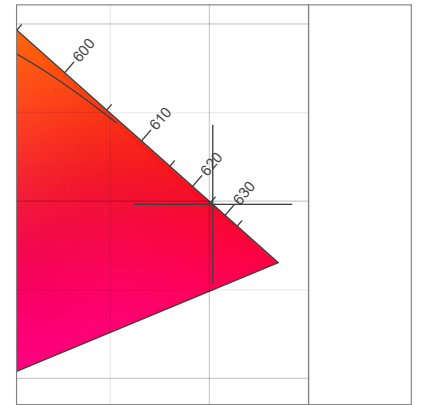
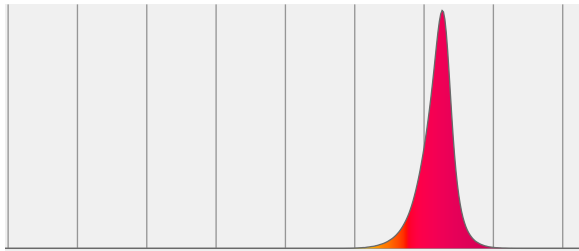


### Measurements

Total Lumen Output: 1067 lm  
 Peak Intensity: 174 cd  
 Efficacy: 22 Lumen/Watt  
 Power: 47.8 W  
 Voltage: 120 V, Current: 0.410 A

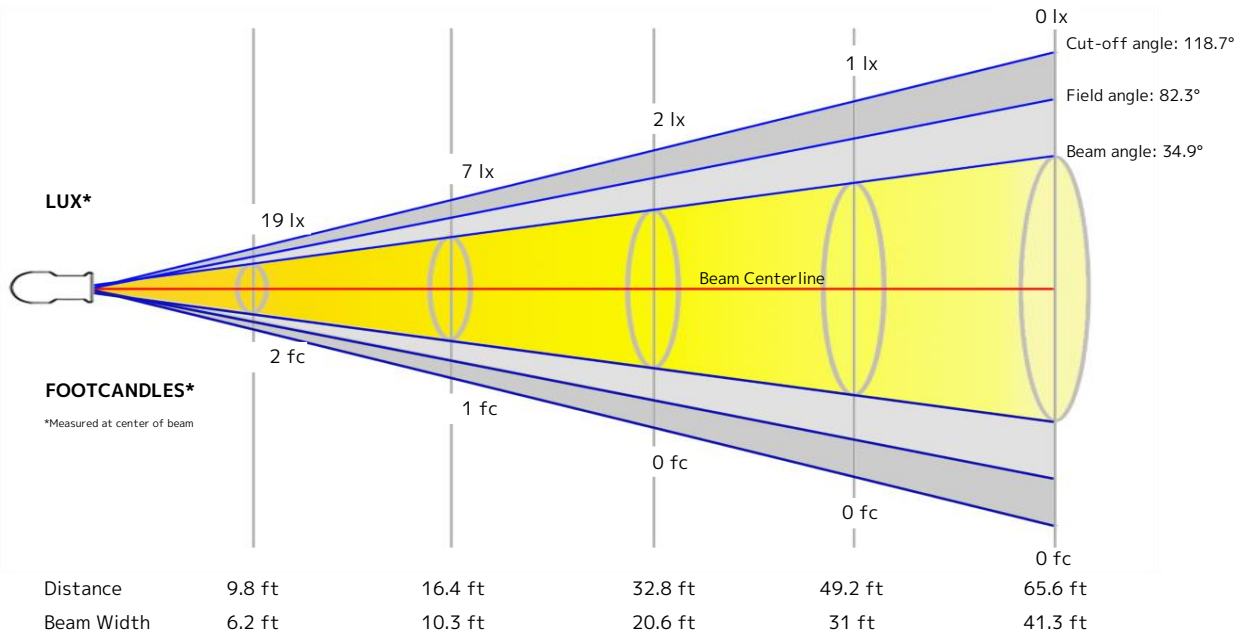


### Spectral Power Distribution Dominant Wavelength 626 nm



| Dominant Wavelength | Color Coordinate CIE 1931 | Color Coordinate CIE1931 | Color Coordinate CIE 1964 | Color Coordinate CIE 1964 |
|---------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| nm                  | x                         | y                        | u                         | v                         |
| 626                 | 0.702                     | 0.298                    | 0.542                     | 0.346                     |

| Distance   | 3 m   | 5 m   | 10 m  | 15 m  | 20 m   |
|------------|-------|-------|-------|-------|--------|
| Beam Width | 1.9 m | 3.1 m | 6.3 m | 9.4 m | 12.6 m |

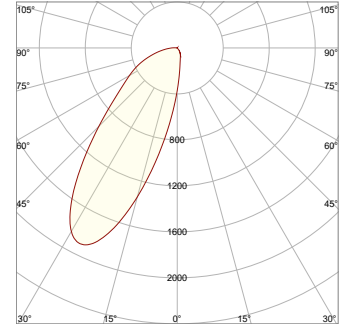
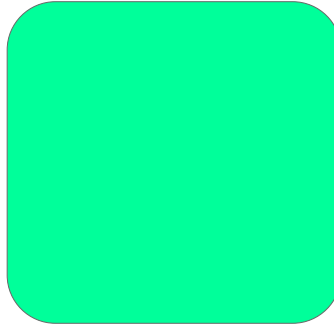


### Beam Intensities from 1-20m

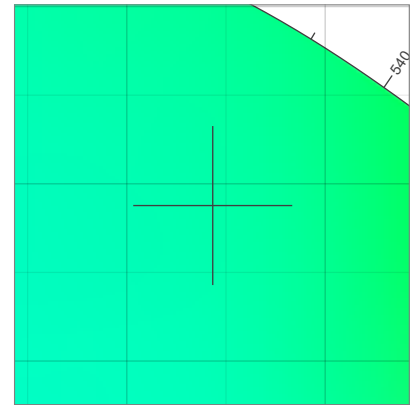
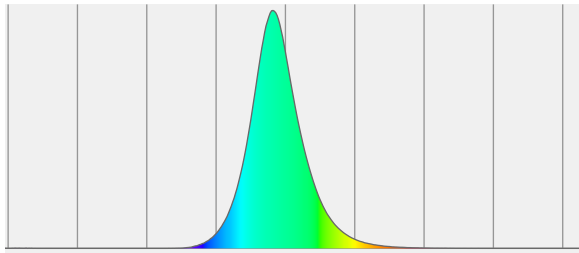
| M         | 1    | 2   | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|-----|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>FT</b> | 3.3  | 6.6 | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>LX</b> | 174  | 43  | 19  | 11   | 7    | 5    | 4   | 3    | 2    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | 0    | 0    |
| <b>FC</b> | 16.2 | 4   | 1.8 | 1    | 0.6  | 0.4  | 0.3 | 0.3  | 0.2  | 0.2  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  | 0    | 0    | 0    |

### Measurements

Total Lumen Output: 2204 lm  
 Peak Intensity: 370 cd  
 Efficacy: 38 Lumen/Watt  
 Power: 58.5 W  
 Voltage: 121 V, Current: 0.493 A

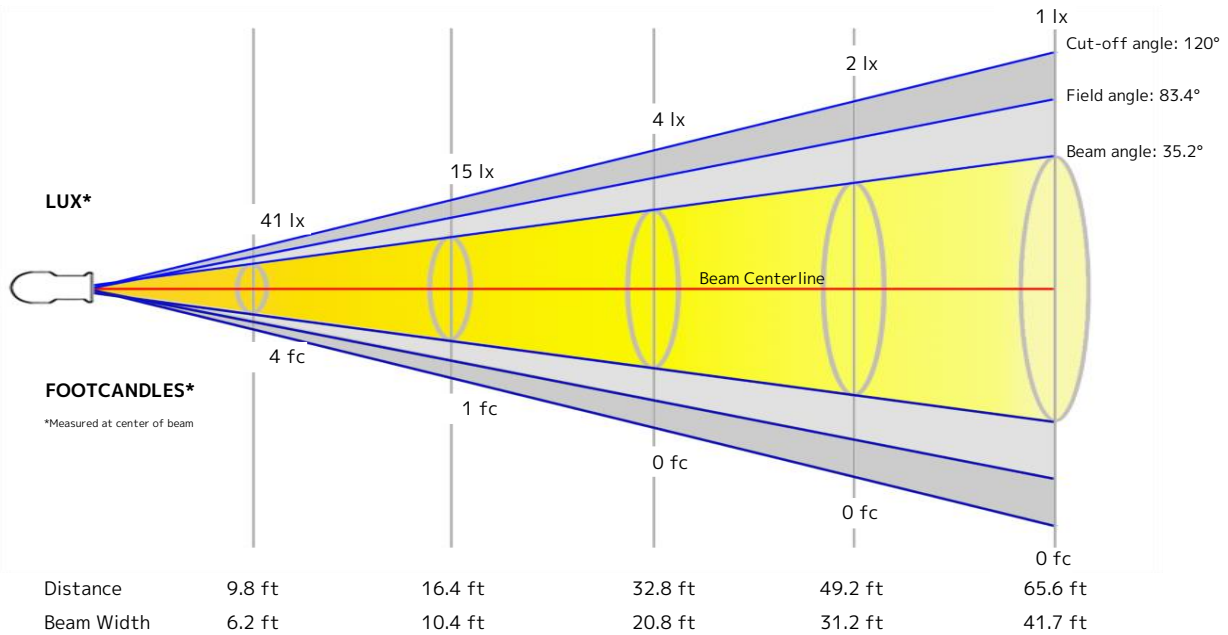


### Spectral Power Distribution Dominant Wavelength 520 nm



| Dominant Wavelength | Color Coordinate CIE 1931 | Color Coordinate CIE1931 | Color Coordinate CIE 1964 | Color Coordinate CIE 1964 |
|---------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| nm                  | x                         | y                        | u                         | v                         |
| 520                 | 0.143                     | 0.688                    | 0.052                     | 0.376                     |

| Distance   | 3 m   | 5 m   | 10 m  | 15 m  | 20 m   |
|------------|-------|-------|-------|-------|--------|
| Beam Width | 1.9 m | 3.2 m | 6.4 m | 9.5 m | 12.7 m |

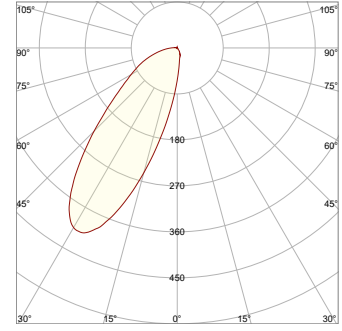
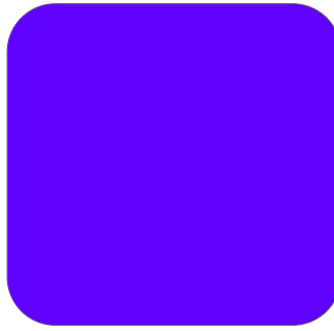


### Beam Intensities from 1-20m

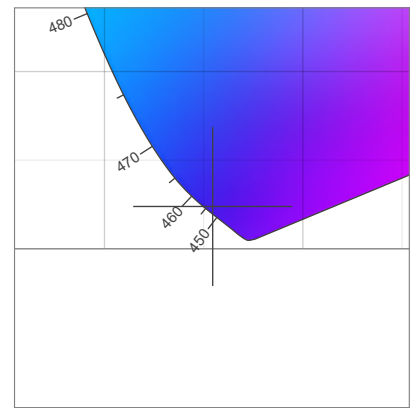
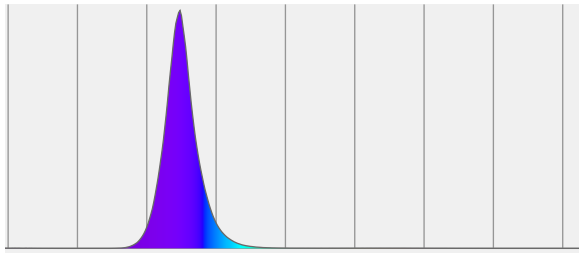
| M         | 1    | 2   | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|-----|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>FT</b> | 3.3  | 6.6 | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>LX</b> | 370  | 92  | 41  | 23   | 15   | 10   | 8   | 6    | 5    | 4    | 3    | 3    | 2    | 2    | 2    | 1    | 1    | 1    | 1    | 1    |
| <b>FC</b> | 34.4 | 8.6 | 3.8 | 2.1  | 1.4  | 1    | 0.7 | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  |

### Measurements

Total Lumen Output: 484 lm  
 Peak Intensity: 62.7 cd  
 Efficacy: 9 Lumen/Watt  
 Power: 55.1 W  
 Voltage: 121 V, Current: 0.467 A

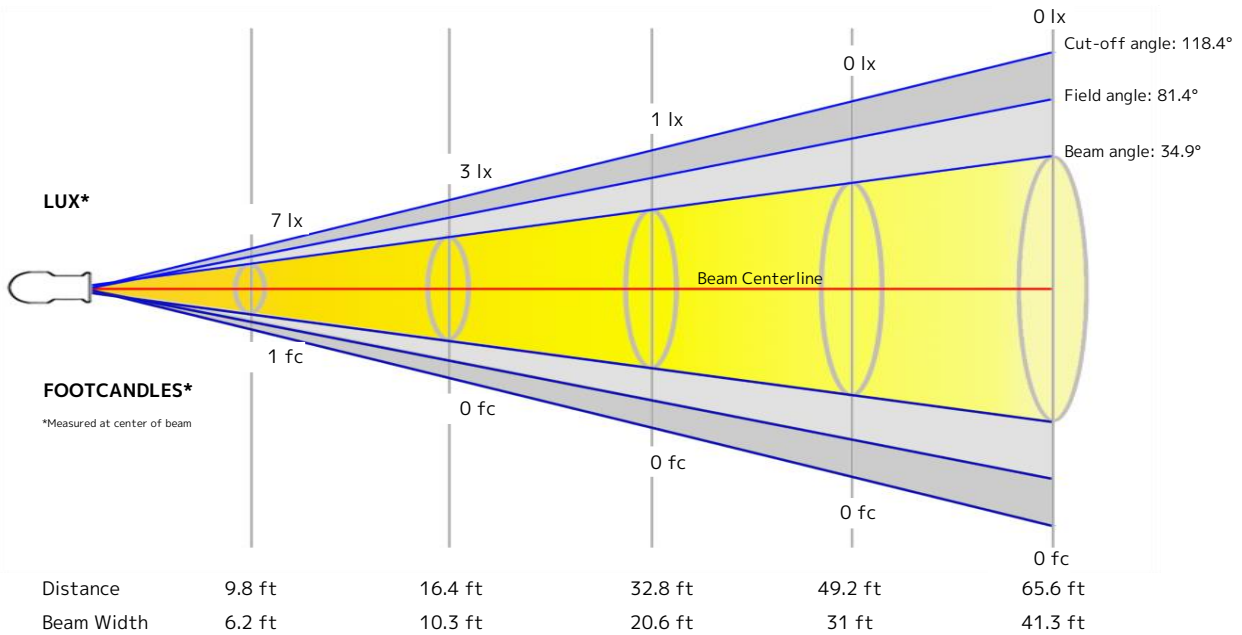


### Spectral Power Distribution Dominant Wavelength 453 nm



| Dominant Wavelength | Color Coordinate CIE 1931 | Color Coordinate CIE1931 | Color Coordinate CIE 1964 | Color Coordinate CIE 1964 |
|---------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| nm                  | x                         | y                        | u                         | v                         |
| 453                 | 0.155                     | 0.024                    | 0.208                     | 0.048                     |

| Distance   | 3 m   | 5 m   | 10 m  | 15 m  | 20 m   |
|------------|-------|-------|-------|-------|--------|
| Beam Width | 1.9 m | 3.1 m | 6.3 m | 9.4 m | 12.6 m |

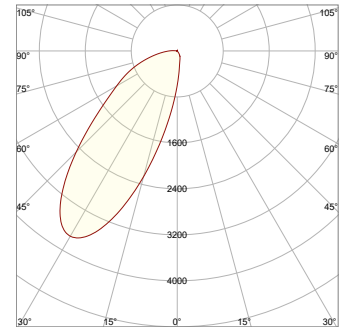
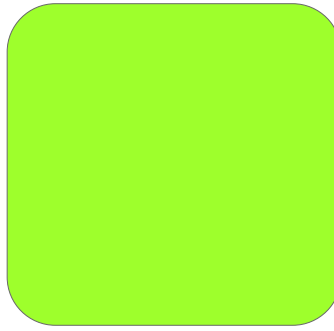


#### Beam Intensities from 1-20m

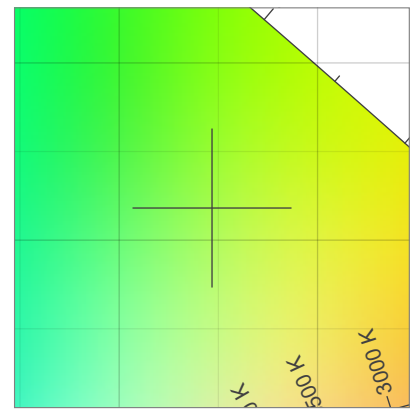
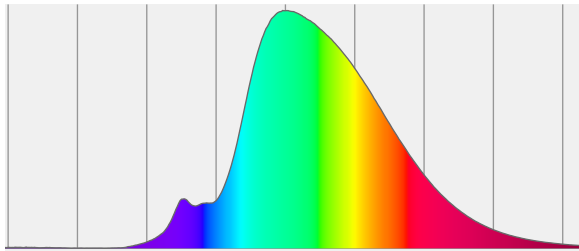
| M         | 1   | 2   | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|-----|-----|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>FT</b> | 3.3 | 6.6 | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>LX</b> | 63  | 16  | 7   | 4    | 3    | 2    | 1   | 1    | 1    | 1    | 1    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |
| <b>FC</b> | 5.8 | 1.5 | 0.6 | 0.4  | 0.2  | 0.2  | 0.1 | 0.1  | 0.1  | 0.1  | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    | 0    |

### Measurements

Total Lumen Output: 4965 lm  
 Peak Intensity: 594 cd  
 Efficacy: 90 Lumen/Watt  
 Power: 55.0 W  
 Voltage: 121 V, Current: 0.466 A

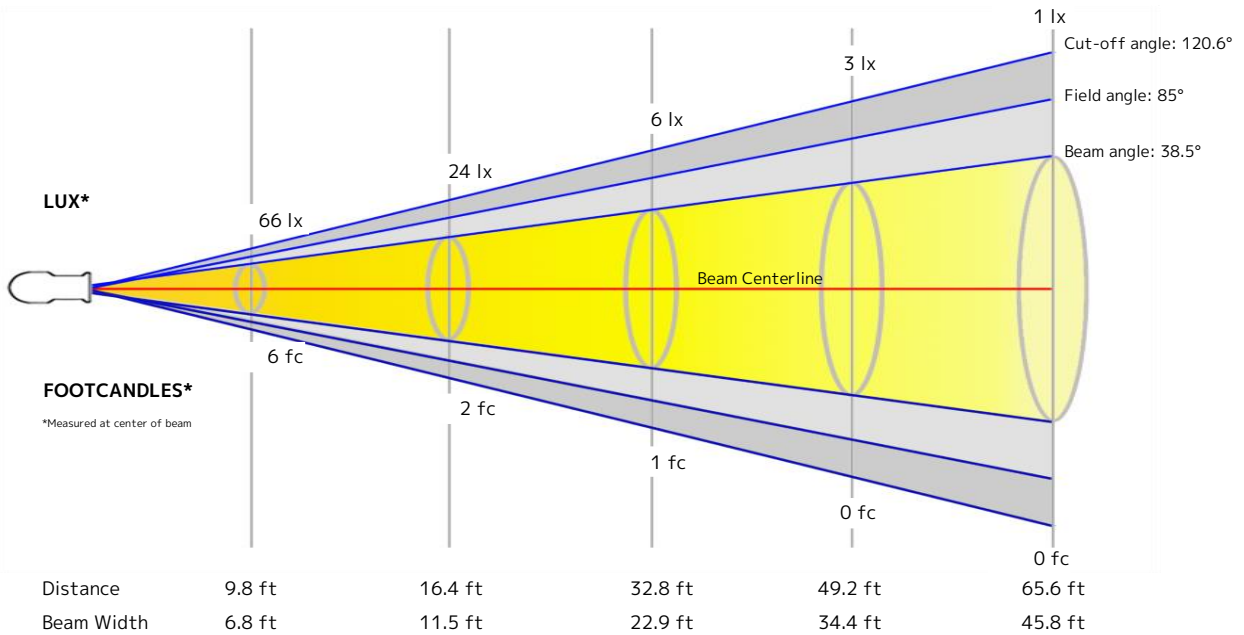


### Spectral Power Distribution Dominant Wavelength 559 nm



| Dominant Wavelength | Color Coordinate CIE 1931 | Color Coordinate CIE1931 | Color Coordinate CIE 1964 | Color Coordinate CIE 1964 |
|---------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| nm                  | x                         | y                        | u                         | v                         |
| 559                 | 0.347                     | 0.518                    | 0.163                     | 0.365                     |

| Distance   | 3 m   | 5 m   | 10 m | 15 m   | 20 m |
|------------|-------|-------|------|--------|------|
| Beam Width | 2.1 m | 3.5 m | 7 m  | 10.5 m | 14 m |

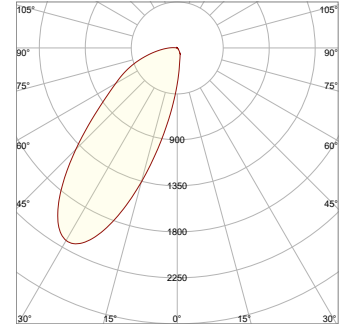
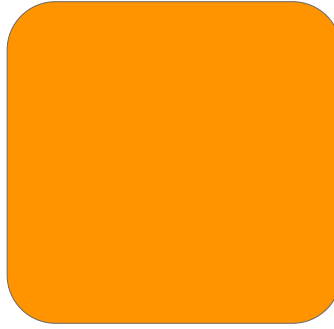


### Beam Intensities from 1-20m

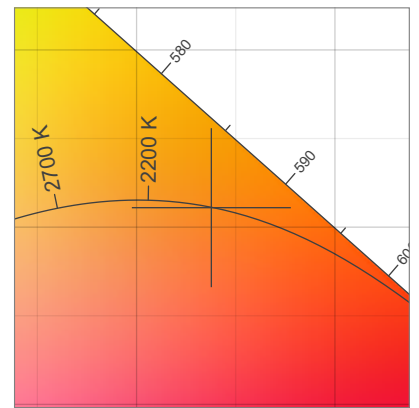
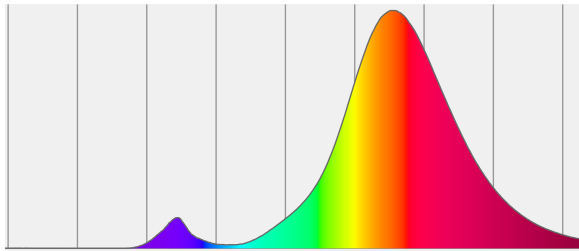
| M  | 1    | 2    | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|----|------|------|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| FT | 3.3  | 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 | 594  | 148  | 66  | 37   | 24   | 16   | 12  | 9    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    | 1    |
| FC | 55.2 | 13.8 | 6.1 | 3.4  | 2.2  | 1.5  | 1.1 | 0.9  | 0.7  | 0.6  | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.2  | 0.2  | 0.1  |

### Measurements

Total Lumen Output: 2866 lm  
 Peak Intensity: 350 cd  
 Efficacy: 52 Lumen/Watt  
 Power: 55.3 W  
 Voltage: 121 V, Current: 0.469 A

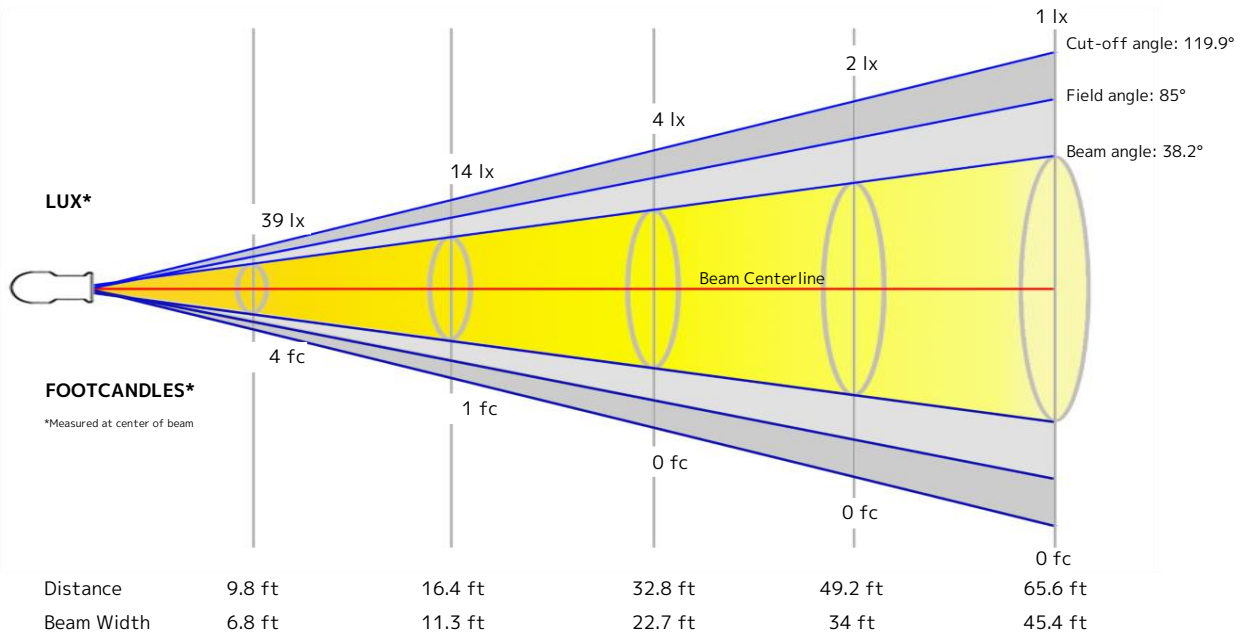


### Spectral Power Distribution Dominant Wavelength 590 nm



| Dominant Wavelength | Color Coordinate CIE 1931 | Color Coordinate CIE1931 | Color Coordinate CIE 1964 | Color Coordinate CIE 1964 |
|---------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| nm                  | x                         | y                        | u                         | v                         |
| 590                 | 0.538                     | 0.411                    | 0.314                     | 0.360                     |

| Distance   | 3 m   | 5 m   | 10 m  | 15 m   | 20 m   |
|------------|-------|-------|-------|--------|--------|
| Beam Width | 2.1 m | 3.5 m | 6.9 m | 10.4 m | 13.8 m |



### Beam Intensities from 1-20m

| M         | 1    | 2   | 3   | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|-----------|------|-----|-----|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
| <b>FT</b> | 3.3  | 6.6 | 9.8 | 13.1 | 16.4 | 19.7 | 23  | 26.2 | 29.5 | 32.8 | 36.1 | 39.4 | 42.7 | 45.9 | 49.2 | 52.5 | 55.8 | 59.1 | 62.3 | 65.6 |
| <b>LX</b> | 350  | 88  | 39  | 22   | 14   | 10   | 7   | 5    | 4    | 4    | 3    | 2    | 2    | 2    | 2    | 1    | 1    | 1    | 1    | 1    |
| <b>FC</b> | 32.6 | 8.1 | 3.6 | 2    | 1.3  | 0.9  | 0.7 | 0.5  | 0.4  | 0.3  | 0.3  | 0.2  | 0.2  | 0.2  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  | 0.1  |