

Light efficiency:

106 Lumens/Watt

Output: 4244 lm

Light quality:

CRI: 81.1

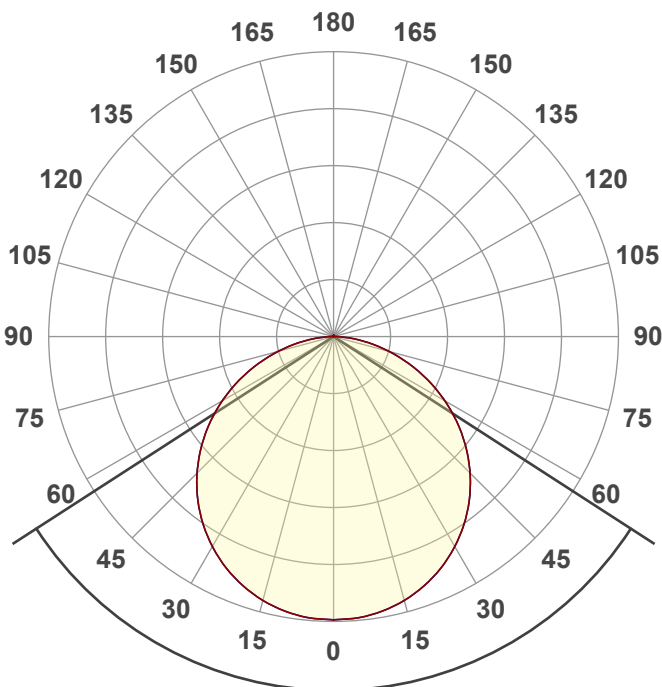
Peak: 1441 cd

Color temperature:

5046 K

Power: 40.1 W

PF: 0.99



Product name:

LPDBL-M1-22-TW3C-SP40BLE

Date and time:

4/12/2023 9:58:50 AM

Beam angle

114.3°

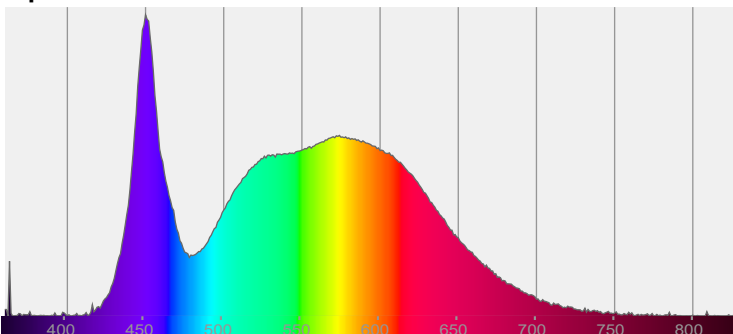


CIE 1931

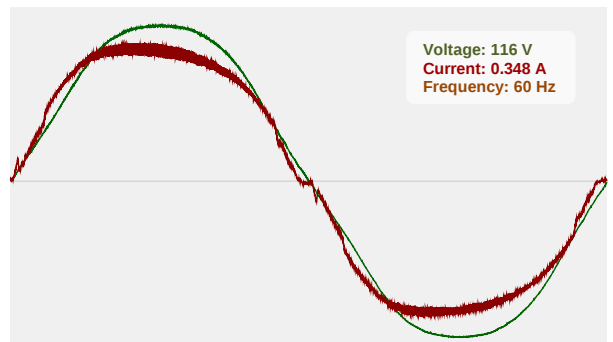
x: 0.345

y: 0.360

Spectra



Power



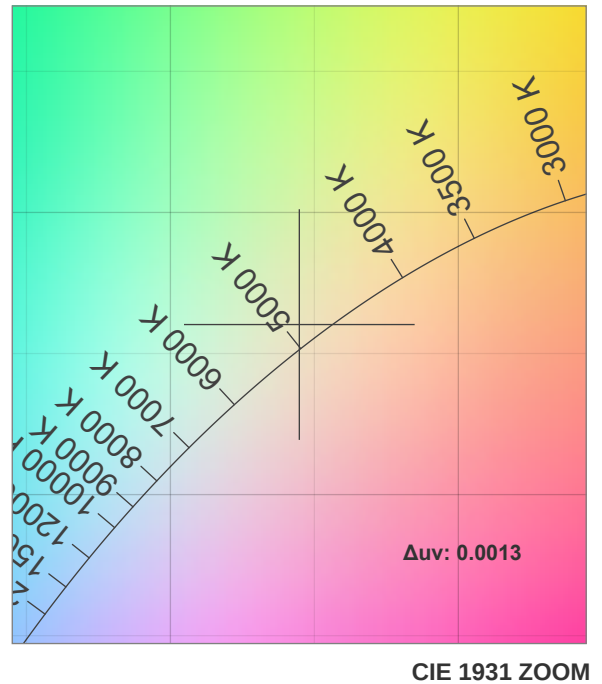
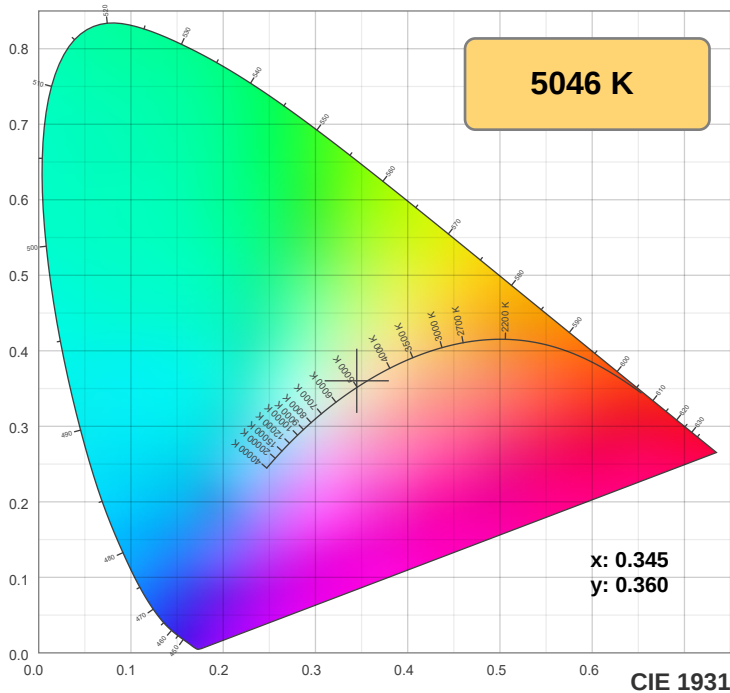
T 314.743.3067

F 314.972.6202

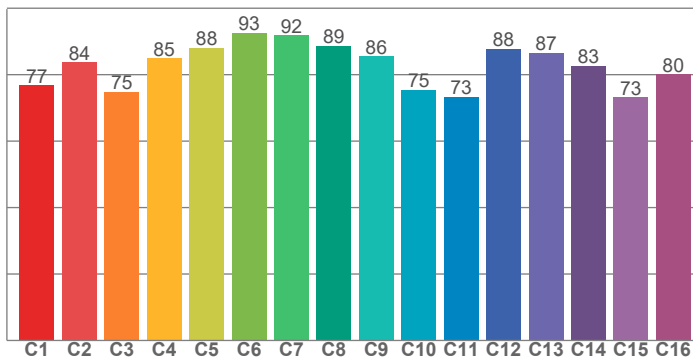
email: [commercial-sales@superbrightleds.com](mailto:commercial-sales@superbrightleds.com)

[www.superbrightleds.com/](http://www.superbrightleds.com/)

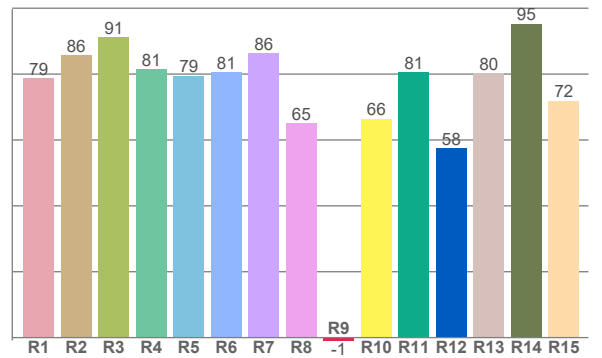
### Color Specifications



TM30: 82.5



CRI: 81.1 (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  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 78.8 | 85.7 | 91.1 | 81.4 | 79.5 | 80.6 | 86.3 | 65.1 | -0.9 | 66.4 | 80.6 | 57.5 | 80.4 | 95.3 | 71.9 |

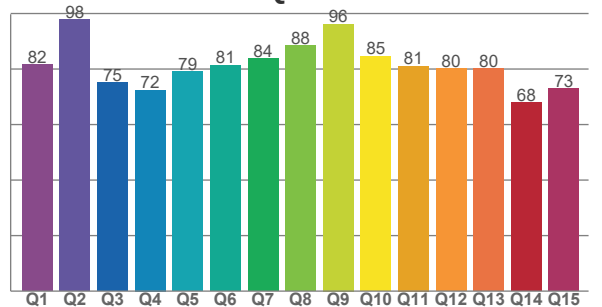
TM30 C values, 16 binned values out of total of 99 C values

| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   | C9   | C10  | C11  | C12  | C13  | C14  | C15  | C16  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 76.7 | 83.7 | 74.8 | 84.9 | 88.1 | 92.7 | 91.8 | 88.6 | 85.6 | 75.3 | 73.3 | 87.7 | 86.5 | 82.6 | 73.2 | 80.1 |

CQS Q values

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 81.5 | 97.8 | 75.0 | 72.5 | 79.0 | 81.4 | 83.7 | 88.4 | 96.3 | 84.6 | 81.1 | 80.1 | 80.1 | 67.8 | 72.9 |

CQS: 79.9



### 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                             |
| 5046 K            | 81.1                  | -0.9          | 82.5           | 95.9        | 79.9                | 0.345                     | 0.360                     | 0.208            | 0.326            | 0.0013                          |



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## TM30 Report

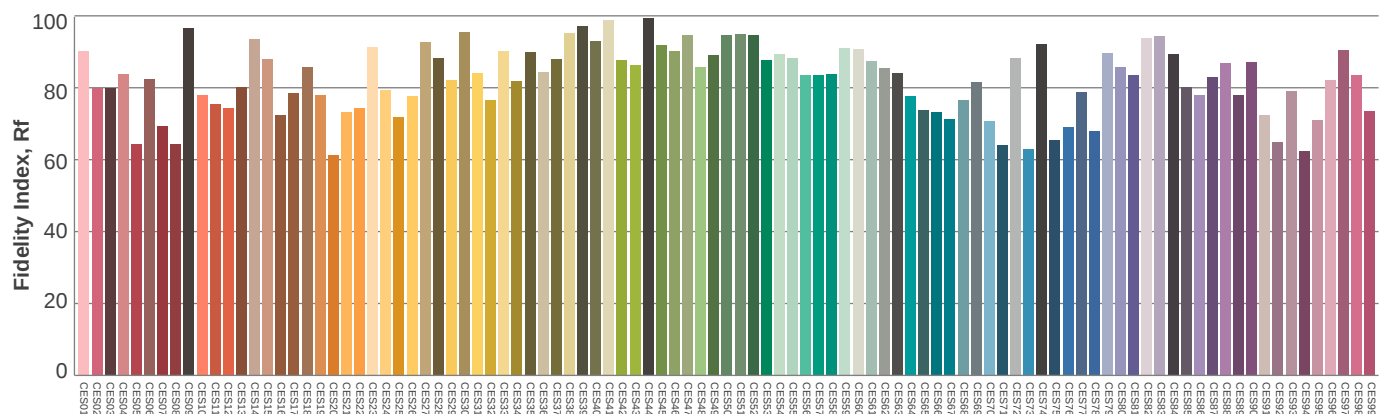
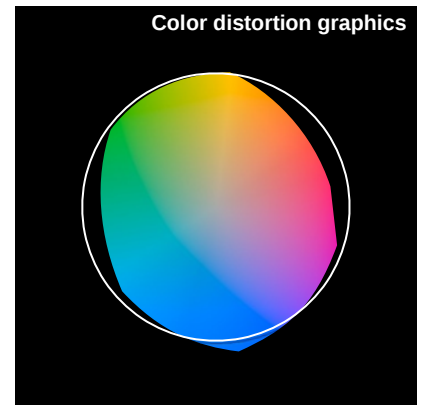
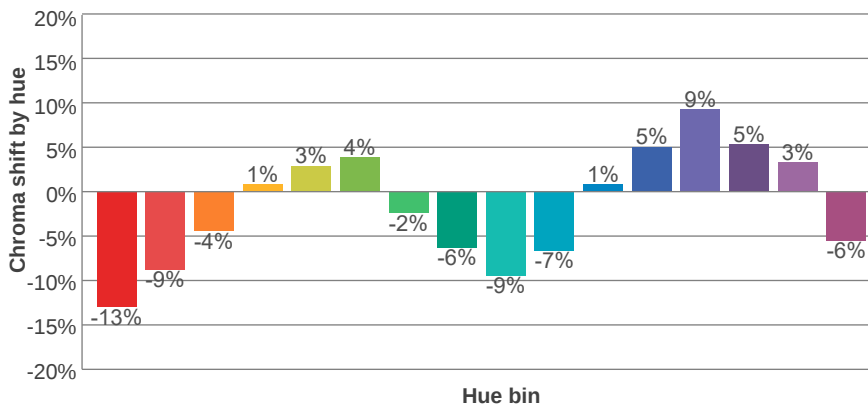
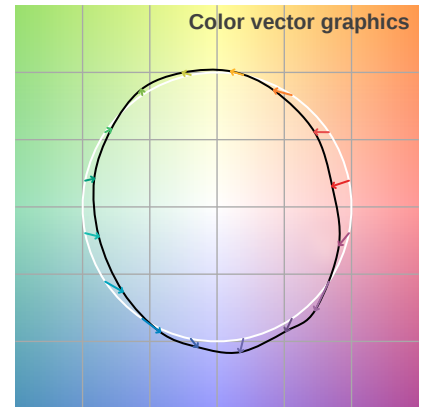
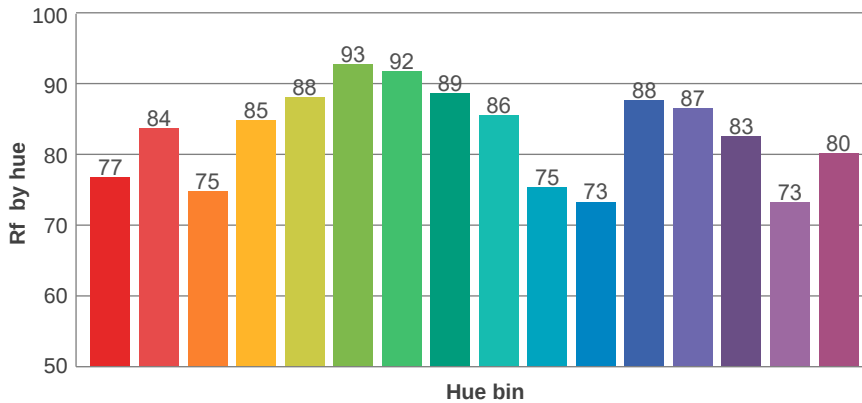
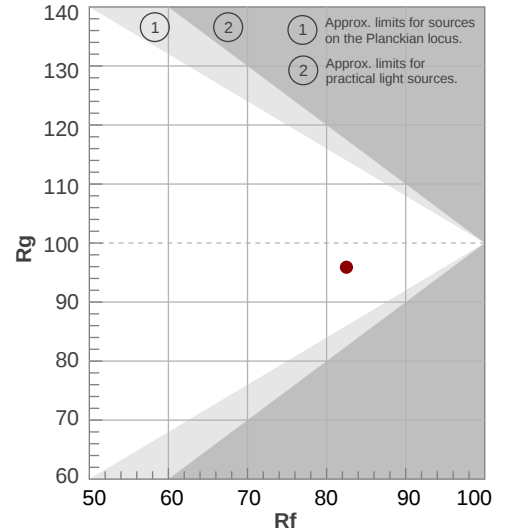
**Rf 82.5**

Fidelity index Rf

**Rg 95.9**

Gammut index Rg

| Hue Bin | R <sub>f</sub> | Graphic shifts (%) |      |
|---------|----------------|--------------------|------|
|         |                | Chroma             | Hue  |
| 1       | 77             | -13%               | -2%  |
| 2       | 84             | -9%                | 6%   |
| 3       | 75             | -4%                | 13%  |
| 4       | 85             | 1%                 | 9%   |
| 5       | 88             | 3%                 | 6%   |
| 6       | 93             | 4%                 | -2%  |
| 7       | 92             | -2%                | -4%  |
| 8       | 89             | -6%                | -3%  |
| 9       | 86             | -9%                | 4%   |
| 10      | 75             | -7%                | 13%  |
| 11      | 73             | 1%                 | 16%  |
| 12      | 88             | 5%                 | 6%   |
| 13      | 87             | 9%                 | -4%  |
| 14      | 83             | 5%                 | -9%  |
| 15      | 73             | 3%                 | -23% |
| 16      | 80             | -6%                | -10% |



Color Evaluation Sample



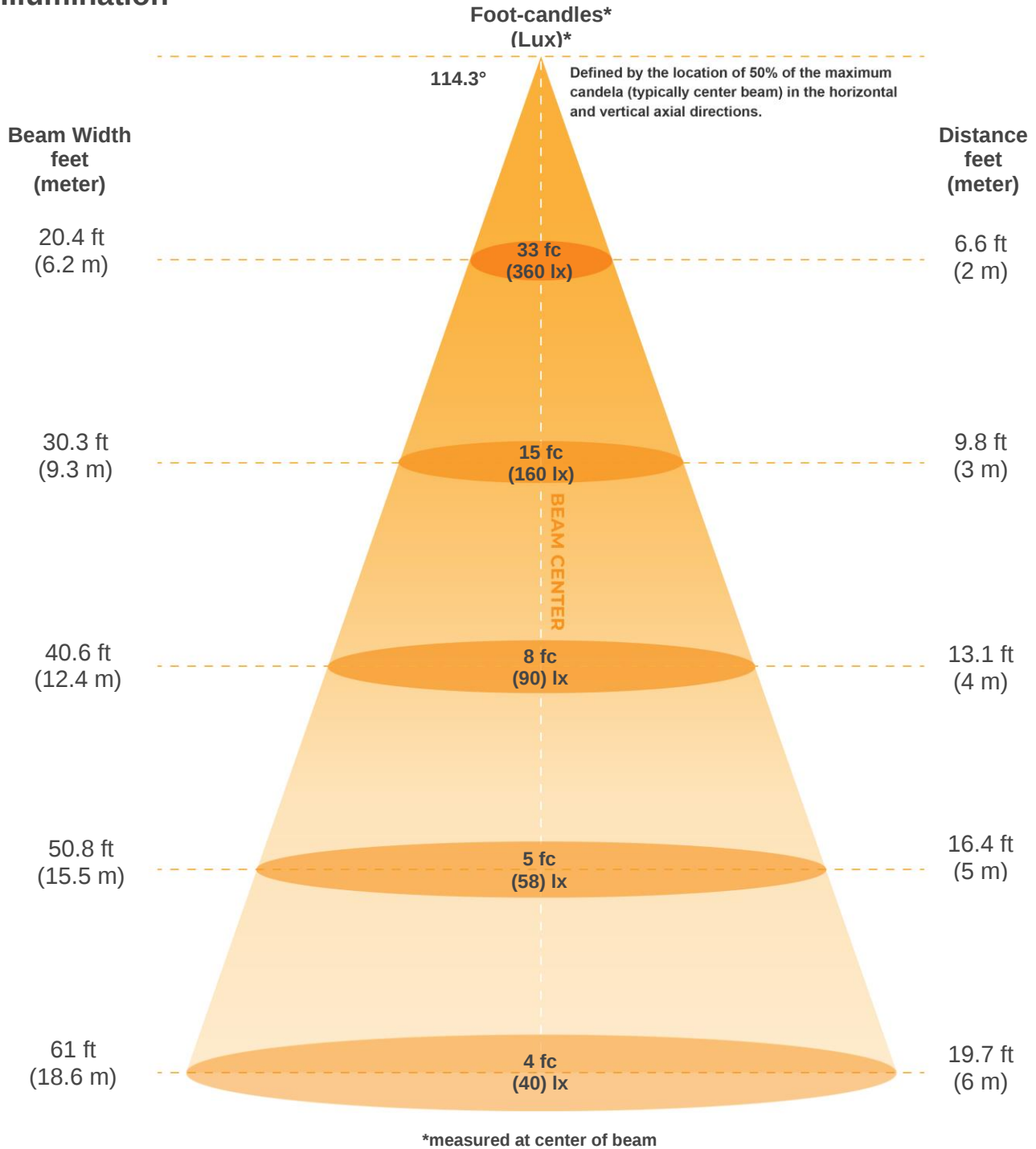
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## Illumination



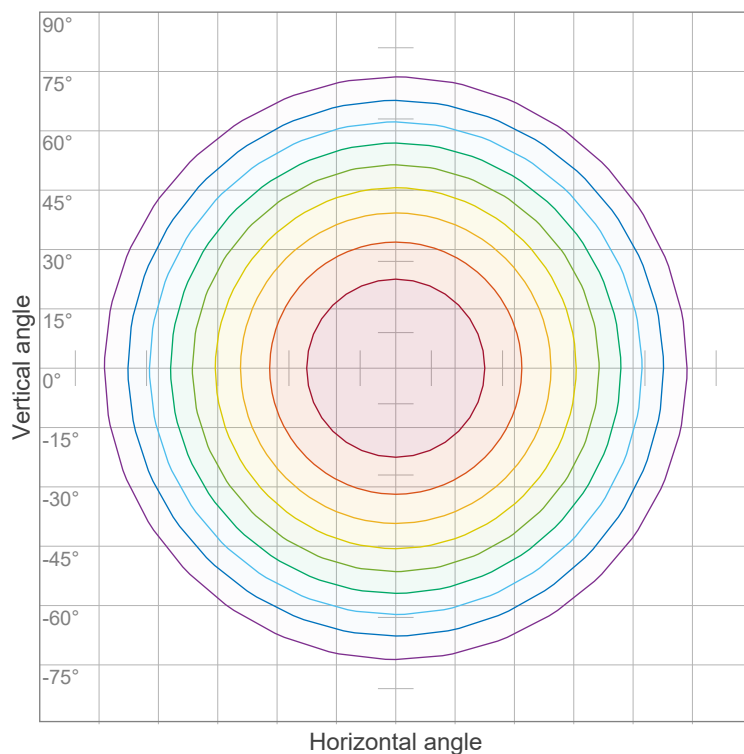
### Beam intensities from 1-20m

| 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 |
| lux | 1441  | 360  | 160  | 90   | 58   | 40   | 29  | 23   | 18   | 14   | 12   | 10   | 9    | 7    | 6    | 6    | 5    | 4    | 4    | 4    |
| fc  | 133.8 | 33.5 | 14.9 | 8.4  | 5.4  | 3.7  | 2.7 | 2.1  | 1.7  | 1.3  | 1.1  | 0.9  | 0.8  | 0.7  | 0.6  | 0.5  | 0.5  | 0.4  | 0.4  | 0.3  |

| Beam angle 50% | Field angle 10% | Cutoff Angle 2.5% | Intensity Ratio in 120° cone | Intensity Ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 114.3°         | 163.6°          | 176°              | 77.6%                        | 52.6%                       |



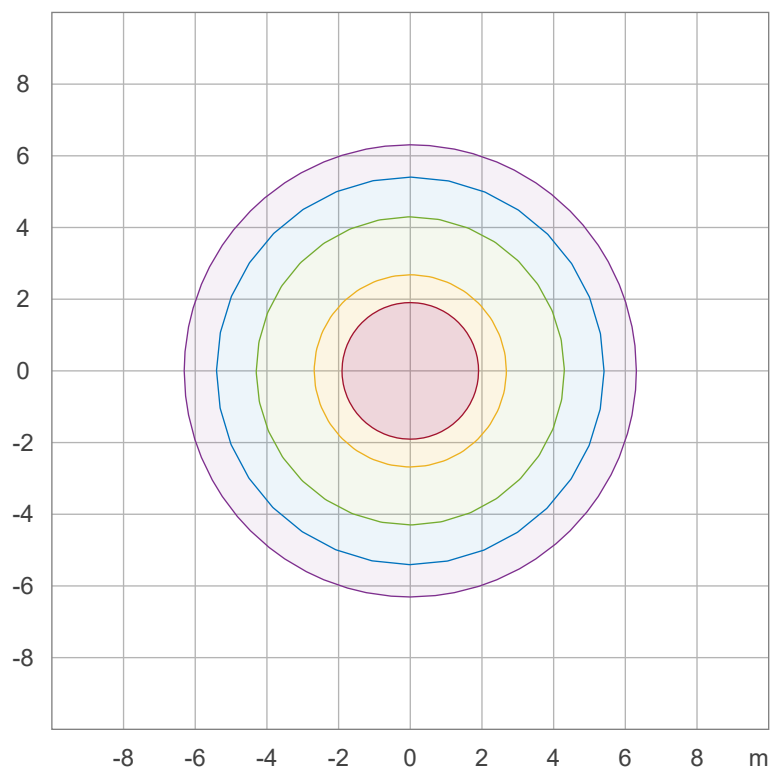
## Iso-intensity Diagram (Iso-candela)



|      |           |
|------|-----------|
| 90 % | 1296.6 cd |
| 80 % | 1152.5 cd |
| 70 % | 1008.5 cd |
| 60 % | 864.4 cd  |
| 50 % | 720.3 cd  |
| 40 % | 576.3 cd  |
| 30 % | 432.2 cd  |
| 20 % | 288.1 cd  |
| 10 % | 144.1 cd  |

Peak intensity: 1440.7 cd  
Number of c-planes: 16

## Iso-illuminance Diagram (Iso-lux)



|        |         |
|--------|---------|
| 50.0 % | 80.0 lx |
| 30.0 % | 48.0 lx |
| 10.0 % | 16.0 lx |
| 5.0 %  | 8.0 lx  |
| 3.0 %  | 4.8 lx  |

Peak illuminance: 160.1 lx  
Mounting height: 3.0 m  
Number of c-planes: 16



## Light Planning – UGR table

*Uncorrected, comprehensive UGR table according to 117-1995*

| Corrected, comprehensive CEN table according to 117-1999             |                |                                                                        |     |     |     |     |                                                                    |     |     |     |     |
|----------------------------------------------------------------------|----------------|------------------------------------------------------------------------|-----|-----|-----|-----|--------------------------------------------------------------------|-----|-----|-----|-----|
| Reflectances                                                         |                |                                                                        |     |     |     |     |                                                                    |     |     |     |     |
|                                                                      | $\rho$ Ceiling | 70                                                                     | 70  | 50  | 50  | 30  | 70                                                                 | 70  | 50  | 50  | 30  |
|                                                                      | $\rho$ Walls   | 50                                                                     | 30  | 50  | 30  | 30  | 50                                                                 | 30  | 50  | 30  | 30  |
|                                                                      | $\rho$ Floor   | 20                                                                     | 20  | 20  | 20  | 20  | 20                                                                 | 20  | 20  | 20  | 20  |
| Room size                                                            |                |                                                                        |     |     |     |     |                                                                    |     |     |     |     |
| H = mounting height<br>above eye level                               |                |                                                                        |     |     |     |     |                                                                    |     |     |     |     |
| X                                                                    | Y              | Viewed Crosswise<br>(Viewing direction orthogonal to lamp length axis) |     |     |     |     | Viewed Endwise<br>(Viewing direction parallel to lamp length axis) |     |     |     |     |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
|                                                                      | n/a            | n/a                                                                    | n/a | n/a | n/a | n/a | n/a                                                                | n/a | n/a | n/a | n/a |
| Variations with the observer position for the luminaire spacings, S: |                |                                                                        |     |     |     |     |                                                                    |     |     |     |     |
|                                                                      | n/a            |                                                                        |     | n/a |     |     |                                                                    |     | n/a |     |     |
|                                                                      | n/a            |                                                                        |     | n/a |     |     |                                                                    |     | n/a |     |     |
|                                                                      | n/a            |                                                                        |     | n/a |     |     |                                                                    |     | n/a |     |     |

UGR data could not be calculated due to missing dimensions. Goto Edit->Photometric->Dimensions and set the fixture/lamp dimensions.

### Coefficients of Utilization

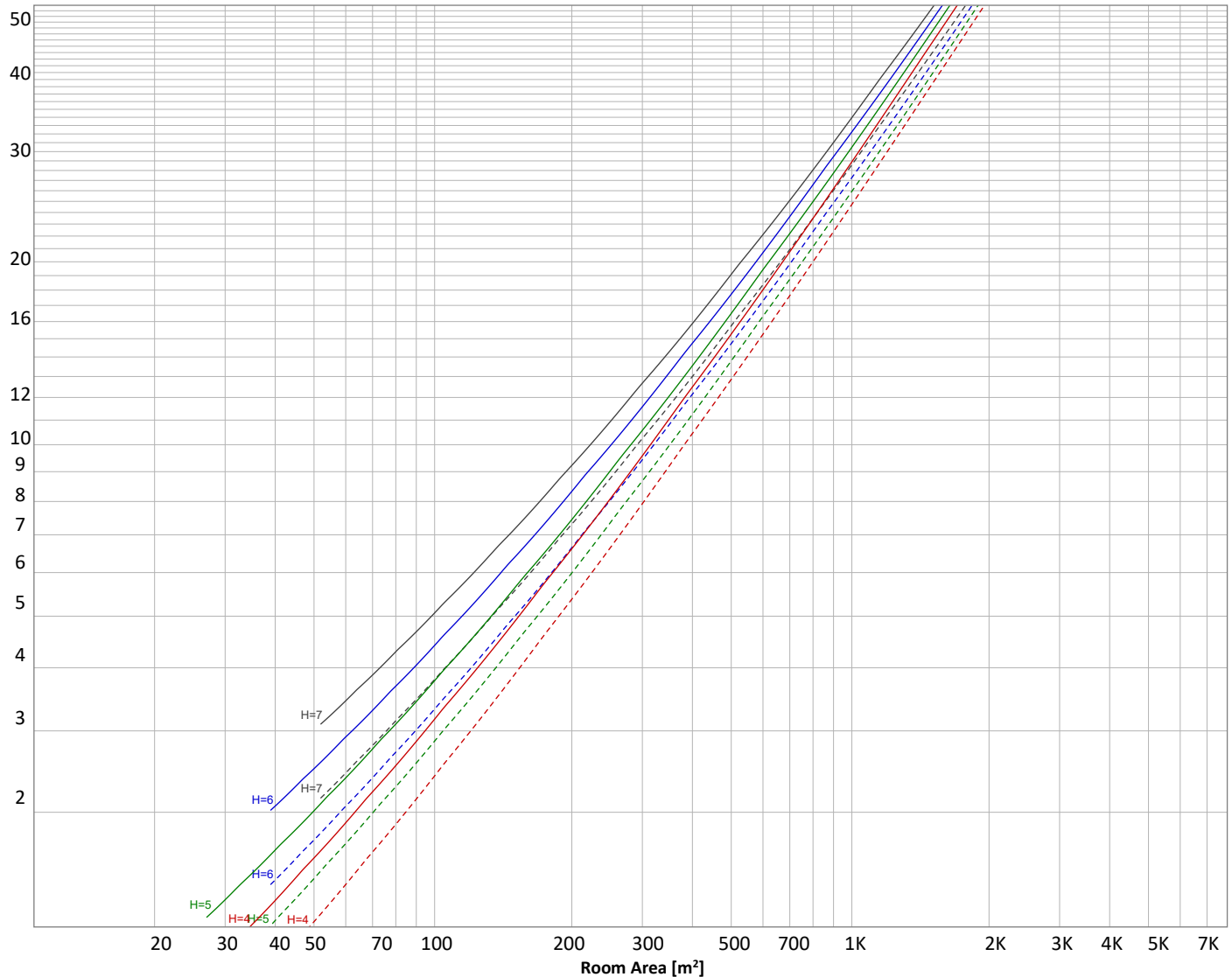
|                     |     |     |                                                                                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|---------------------|-----|-----|--------------------------------------------------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Ceiling reflectance | 80  |     |                                                                                | 70  |     |     | 50  |     |     | 30  |     |     | 10  |     |     | 0   |     |     |
| Wall reflectance    | 70  | 50  | 30                                                                             | 10  | 70  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 50  | 30  | 10  | 0   |
| Floor reflectance   | 20  | 20  | 20                                                                             | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 20  | 0   |
| RCR                 |     |     | (RCR: Room Cavity Ratio)                                                       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|                     |     |     | Room Values are expressed as percentage of Lumen delivered to the task surface |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 0                   | 119 | 119 | 119                                                                            | 119 | 116 | 116 | 116 | 116 | 111 | 111 | 111 | 106 | 106 | 106 | 102 | 102 | 102 | 100 |
| 1                   | 108 | 103 | 99                                                                             | 95  | 106 | 101 | 97  | 94  | 97  | 94  | 90  | 93  | 90  | 88  | 89  | 87  | 85  | 83  |
| 2                   | 98  | 90  | 83                                                                             | 77  | 96  | 88  | 82  | 76  | 84  | 79  | 74  | 81  | 77  | 73  | 78  | 74  | 71  | 69  |
| 3                   | 90  | 79  | 70                                                                             | 64  | 87  | 77  | 69  | 63  | 74  | 68  | 62  | 71  | 66  | 61  | 69  | 64  | 60  | 58  |
| 4                   | 82  | 70  | 61                                                                             | 54  | 80  | 68  | 60  | 54  | 66  | 59  | 53  | 63  | 57  | 52  | 61  | 56  | 51  | 49  |
| 5                   | 75  | 62  | 53                                                                             | 46  | 73  | 61  | 52  | 46  | 59  | 51  | 46  | 57  | 50  | 45  | 55  | 49  | 44  | 42  |
| 6                   | 69  | 56  | 47                                                                             | 40  | 67  | 55  | 46  | 40  | 53  | 45  | 40  | 51  | 45  | 39  | 50  | 44  | 39  | 37  |
| 7                   | 64  | 51  | 42                                                                             | 36  | 63  | 50  | 41  | 35  | 48  | 41  | 35  | 47  | 40  | 35  | 45  | 39  | 35  | 33  |
| 8                   | 60  | 46  | 38                                                                             | 32  | 58  | 45  | 37  | 32  | 44  | 37  | 31  | 43  | 36  | 31  | 42  | 35  | 31  | 29  |
| 9                   | 56  | 42  | 34                                                                             | 28  | 54  | 42  | 34  | 28  | 41  | 33  | 28  | 39  | 33  | 28  | 38  | 32  | 28  | 26  |
| 10                  | 52  | 39  | 31                                                                             | 26  | 51  | 39  | 31  | 26  | 38  | 30  | 26  | 37  | 30  | 25  | 36  | 30  | 25  | 24  |



## Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



### Conditions

|                                                   |                |           |                     |                   |
|---------------------------------------------------|----------------|-----------|---------------------|-------------------|
| H = Room height                                   | Flux = 4244 lm | p(%)      |                     |                   |
| H <sub>down</sub> = Lamp distance from ceiling =  | 0.00 m         | Line type | Ceiling reflectance | Wall reflectance  |
| H <sub>work</sub> = Work area height from floor = | 0.00 m         | -----     | 70                  | 50                |
| E <sub>work</sub> = Average lux on work area =    | 100 lx         | _____     | 50                  | 30                |
|                                                   |                |           |                     | Floor reflectance |
|                                                   |                |           |                     | 20                |

### Zonal Lumen Summary

| 0°-10°   | 10°-20°   | 20°-30°   | 30°-40°   | 40°-50°   | 50°-60°   | 60°-70°   | 70°-80°   | 80°-90°   |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 136 lm   | 392 lm    | 597 lm    | 725 lm    | 757 lm    | 688 lm    | 528 lm    | 311 lm    | 95.2 lm   |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 4.41 lm  | 1.63 lm   | 1.88 lm   | 1.90 lm   | 1.80 lm   | 1.67 lm   | 1.34 lm   | 0.851 lm  | 0.284 lm  |

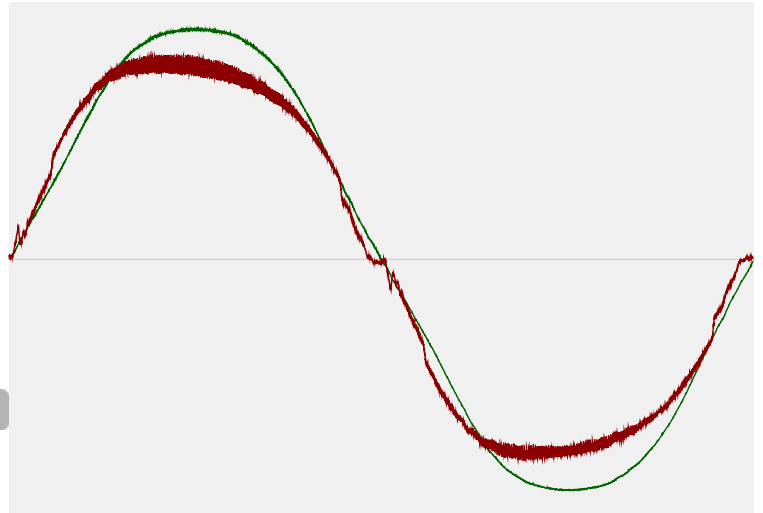


## Power Details

### Input Power

|                                                     |          |
|-----------------------------------------------------|----------|
| Power feed to light source                          | 40.1 W   |
| Frequency of input power                            | 60 Hz    |
| RMS Input voltage feed, $V_{RMS}$                   | 116 V    |
| RMS Input current feed, $I_{RMS}$                   | 0.348 A  |
| Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$ | 40.33 VA |
| Displacement factor of AC power feed                | 1.0      |
| Power factor of AC current feed                     | 0.99     |
| Total harmonic distortion of the current            | 9.07%    |
| Total harmonic distortion of the voltage            | 2.78%    |

### Input Power Curve



### Efficiency

Radiated power efficiency 32.1%



Lumen efficiency 106 lm/W



## Stabilization Details

### Warmup Conditions

|                   |        |
|-------------------|--------|
| Stable period     | 15 min |
| Stable change max | 2.0%   |
| Minimum time      | 15 min |

### Color Temperature Change

|           |        |
|-----------|--------|
| CCT start | 5023 K |
| CCT shift | +23 K  |
| CCT end   | 5046 K |

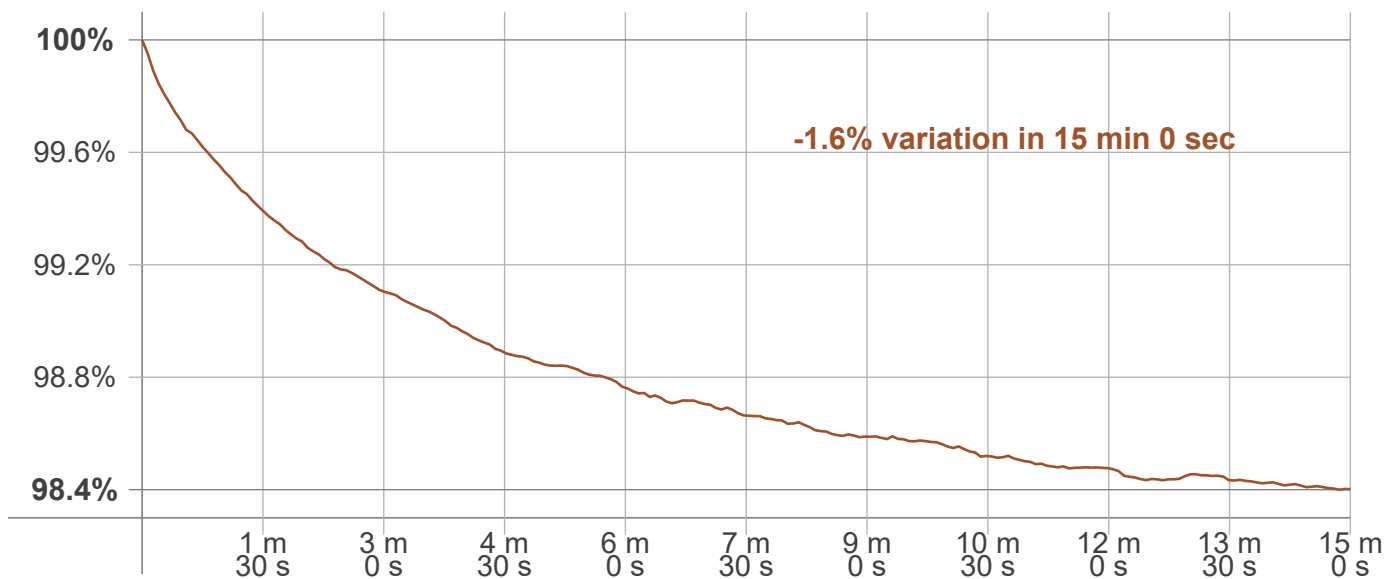
### Warmup Result

|                   |                                 |
|-------------------|---------------------------------|
| Total warmup time | Lamp stabilized in 15 min 0 sec |
| Warmup variation  | -1.6%                           |

### Output Change

|               |         |
|---------------|---------|
| Output start  | 4304 lm |
| Output change | -60 lm  |
| Output end    | 4244 lm |

### Stabilization Curve



## Flicker /TLA details



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[www.superbriteleds.com/](http://www.superbriteleds.com/)

Flicker Meter Type Viso Systems LabFlicker  
Frequency of input power 60 Hz  
Flicker/TLA sample rate 20000 samples/s

Measurement time  
PstLM 180 sec  
All other indices 1.2 sec

### Flicker indices according to Illuminating Engineering Society (IES)

Flicker frequency 119.76 Hz  
Percent Flicker 1.23 %  
Flicker index 0

### Flicker indices per California Energy Commission (CEC) 2016b

JA8/10 40 Hz 0.04 %  
JA8/10 90 Hz 0.14 %  
JA8/10 200 Hz 1.13 %  
JA8/10 400 Hz 1.2 %  
JA8/10 1000 Hz 1.23 %

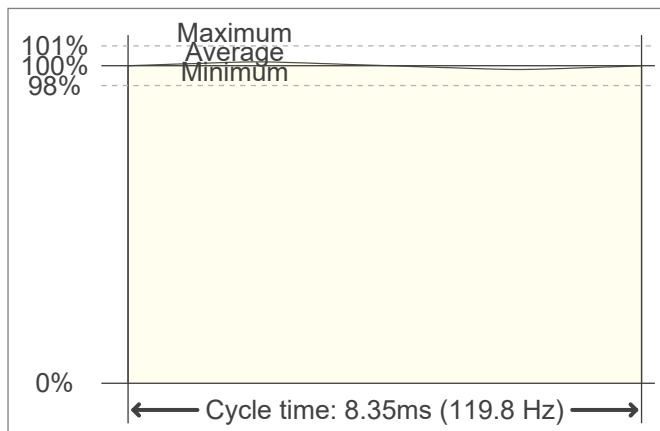
### TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value ( $F < 80$  Hz) 0.08  
SVM value ( $80 < F < 2000$  Hz) 0.04

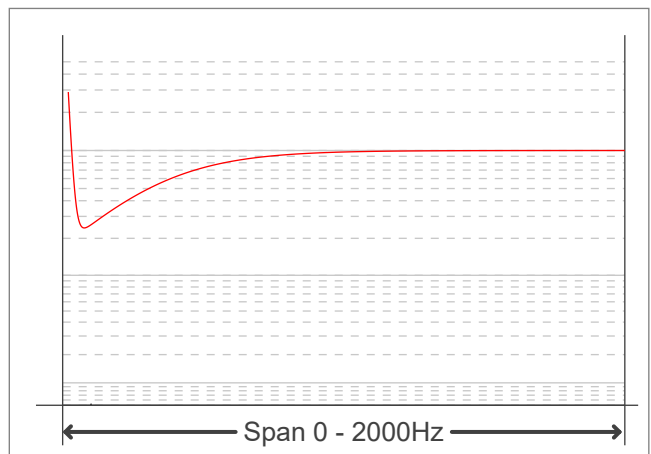
### Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp 0.02

### Flicker frame (frame of one flicker period in time domain)



### Flicker FFT (flicker curve in frequency domain)



### IEEE 1789 Frequency/modulation plot

