# Light Measurement Report

Print date: 21-10-2024
Measurement date and time: 21-10-2024 16:14:14 – Measurement no. VFR-241021-1468-MS
Measurement tracking No. and Link: VT241021-004470
Operator:

## Laboratory and Equipment

| | |
|---|---|
| Laboratory Owner and Location | Viso Systems, Copenhagen V, Denmark |
| Goniospectrometer System and Type | LabSpion – Type C, horizontal |
| Sensor Name, Calibr. Date and Serial No. | LabSensor Model2 – 11-1-2024 – 3130191315 |
| Spectrometer Manufacturer and Model | Ibsen Photonics, Denmark – Freedom VIS (Custom Viso) |

## Measurement Conditions

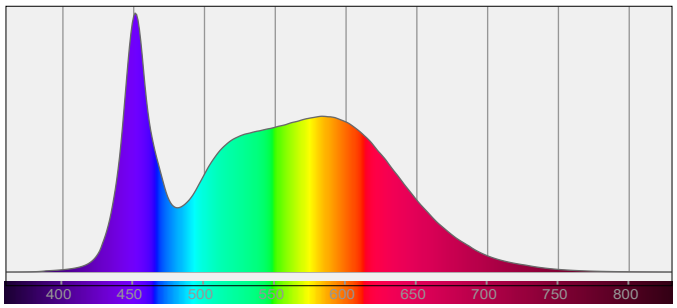
| | |
|---|---|
| Number of C-planes and Resolution | 12 planes – 30° |
| γ (gamma)-Resolution | 5° |
| Test Distance | 2,00 m |
| Input Power, Power and Displ. Factors | 11,5 W – PF 0,94 – DPF 0,95 |
| Input RMS Voltage and Current | 230 V – 0,053 A |
| Frequency of Input Power | 50 Hz |
| Warm-up Time and Variation | Lamp stabilized in 15 min 0 sec – 2,0% |

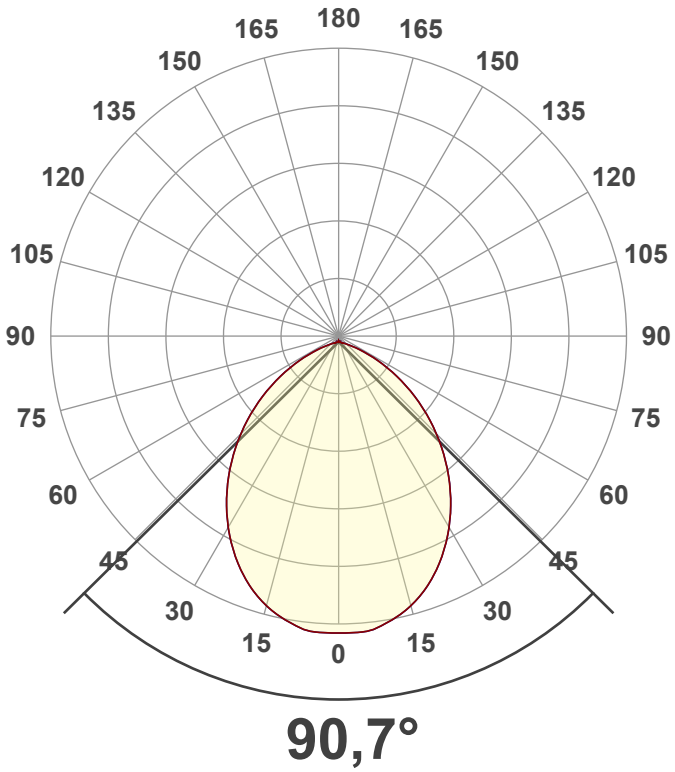
## Tested Light Source

| | |
|---|---|
| Product Name | 271357-5000K |
| Item No. and Manufacturer | 271357-5000K – Dutchfulfillment |
| Product Description (line 1) | LED DOWNLIGHT \| ORTHO \| CCT-SWITCH \| Ø120 \| 12W \| ZWART |

## Main Light Measurement Results

| | |
|---|---|
| Output – Total Lumen (Up% / Down%) | 1096 lm – 0,1% / 99,9% |
| Efficiency | 95 lm/W |
| Peak Intensity and Beam Angle | 539 cd – 90,7° |
| Correlated Color Temperature, Target/Measured | CCT = 5000 K / 5151 K |
| Color Rendering Index | CRI 83,9 |
| Color Rendering TM30-18 | $R_f$ 84,3 – $R_g$ 96,2 |
| Color Shift, CIE duv and MacAdam Steps | Duv 0,0010 – SDCM 3,3 |
| Flicker | SVM 0,88 – PstLM 0,02 |



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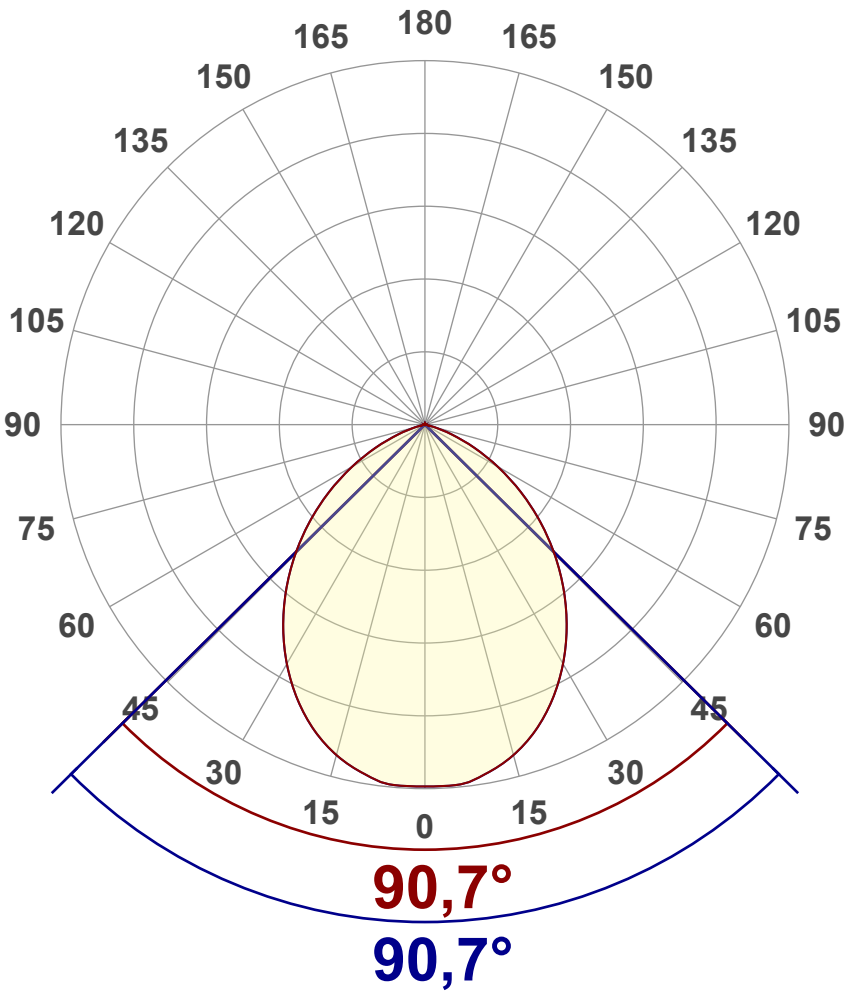
## Luminous Intensity diagram

Unit: 0-100% of peak intensity




## Main Values

| | |
|---|---|
| Output (total Lumen) | 1096 lm |
| Lumen Up% / Down% | 0,1% / 99,9% |
| Peak Intensity | 539 cd |
| Beam Angle (50%) | 90,7° |
| Beam Angle (90%) | 90,7° |
| Beam Angle (10%) | 90,7° |

## Cut-off Angle

| | |
|---|---|
| Average 2,5% | 150,9° |

## Field Angle

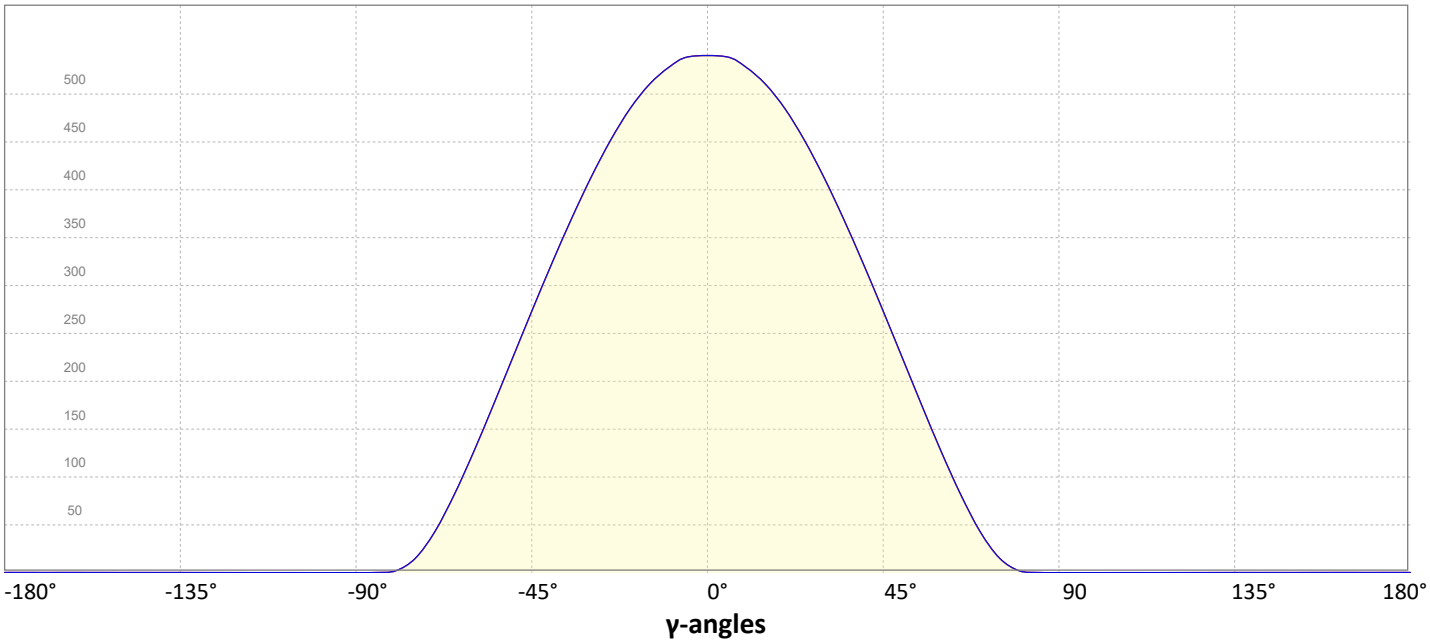
| | |
|---|---|
| Average 10% | 136,8° |

## Intensity Ratio

| | |
|---|---|
| In 120° cone | 90,8% |
| In 90° cone | 67,5% |

**C000-C180**
**C090-C270**

## Linear distribution diagram - Intensity (candela) vs γ-angle



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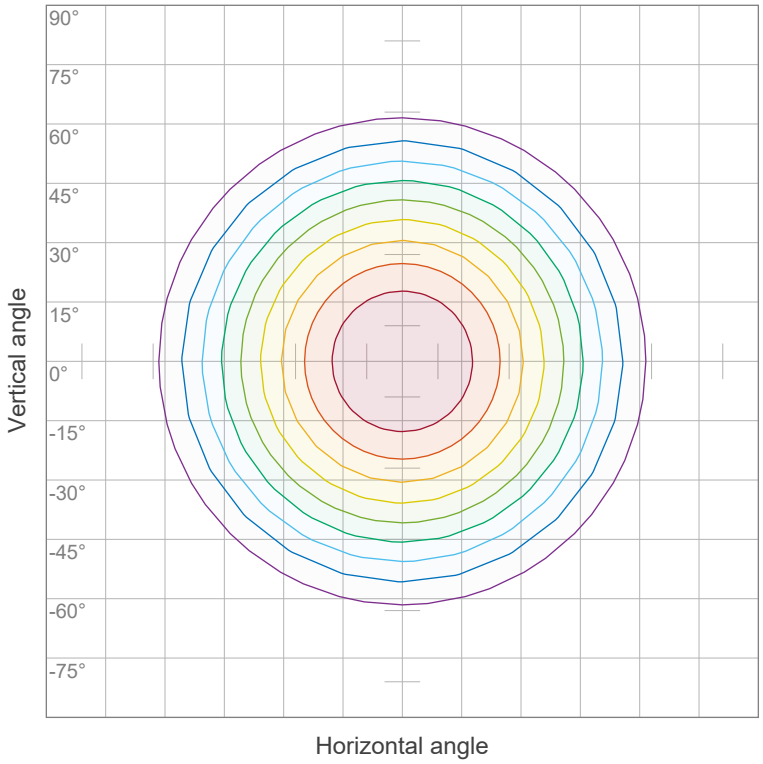
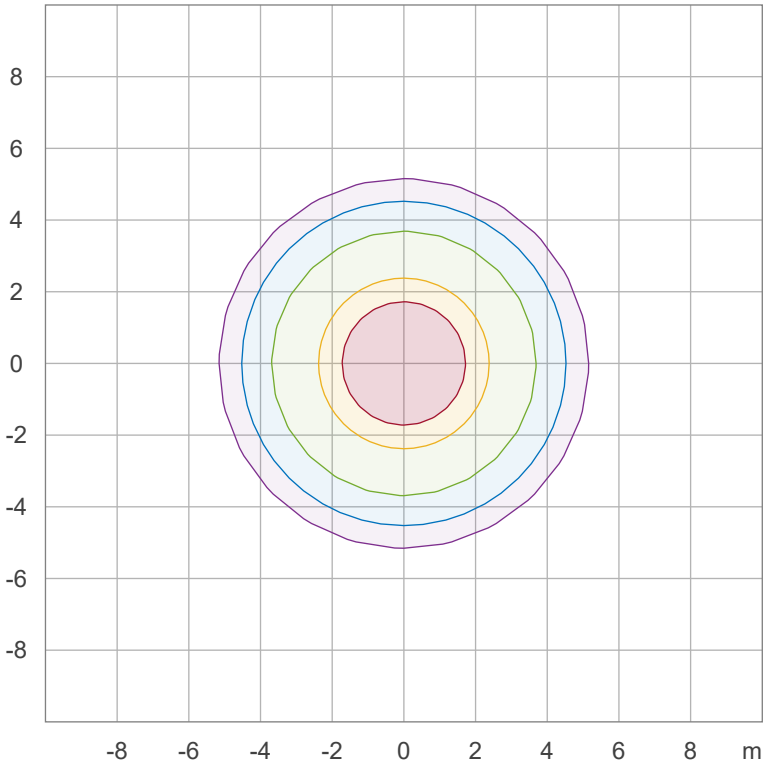
## Iso-intensity Diagram (Iso-candela)




| | |
|---|---|
| 90 % | 485,0 cd |
| 80 % | 431,1 cd |
| 70 % | 377,2 cd |
| 60 % | 323,4 cd |
| 50 % | 269,5 cd |
| 40 % | 215,6 cd |
| 30 % | 161,7 cd |
| 20 % | 107,8 cd |
| 10 % | 53,9 cd |

Peak intensity: 538,9 cd
Number of c-planes: 12

## Iso-illuminance Diagram (Iso-lux)




| | |
|---|---|
| 50,0 % | 29,9 lx |
| 30,0 % | 18,0 lx |
| 10,0 % | 6,0 lx |
| 5,0 % | 3,0 lx |
| 3,0 % | 1,8 lx |

Peak illuminance: 59,9 lx
Mounting height: 3,0 m
Number of c-planes: 12

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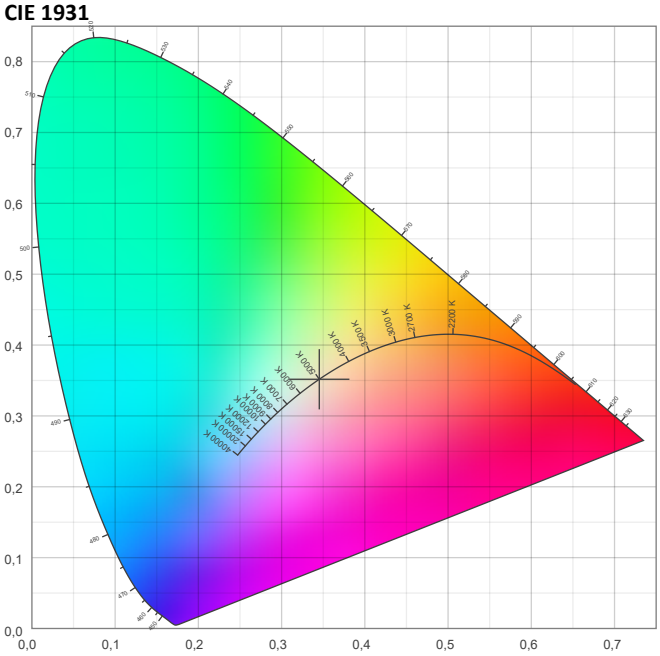
## Color details

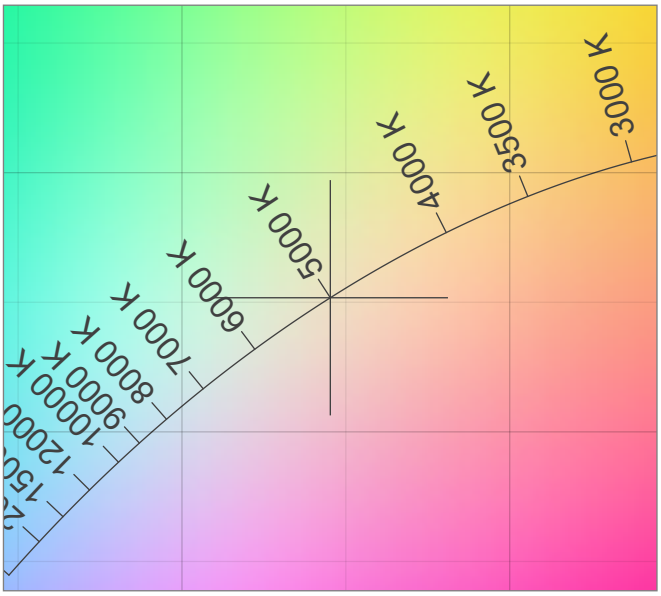
| | |
|---|---|
| Correlated Color Temperature, Target | CCT = 5000 K |
| Correlated Color Temperature, Measured | CCT = 5151 K |
| Color Rendering Index | CRI 83,9 |
| Color Rendering Index, R9 (red component) | R9 = 10,4 |
| Color Rendering TM30-18 | $R_f$ 84,3 – $R_g$ 96,2 |
| Color Quality Scale | CQS = 81,8 |

| | |
|---|---|
| MacAdam Steps | SDCM = 3,3 |
| Color coordinates CIE 1931 | (x;y) = (0,345;0,352) |
| Color coordinate CIEs 1960 | (u;v) = (0,211;0,323) |
| Color deviation from BBL | Duv = 0,0010 |
| Color coordinate CIEs 1976 (CIELUV) | (u';v') = (0,211;0,485) |

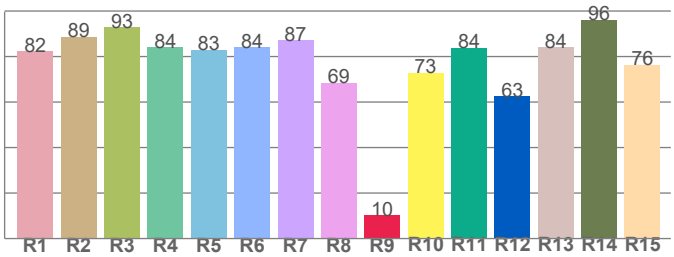
### CIE 1931




### CIE 1931 – zoomed on Planckian locus



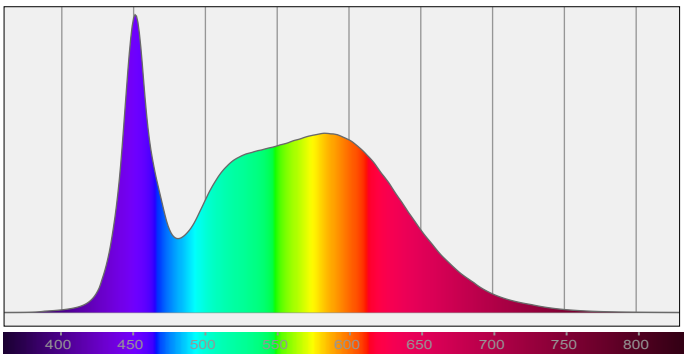

### Color Rendering Index per reference color (CIE 1995)



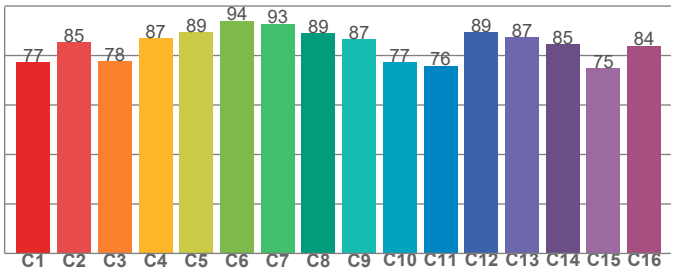

CRI R values, only R1-R8 are used to calculate final CRI value

| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 82,4 | 88,7 | 92,8 | 84,1 | 83,0 | 84,1 | 87,3 | 68,5 | 10,4 | 73,0 | 83,9 | 62,6 | 84,2 | 96,2 | 76,3 |

### Spectral power distribution (SPD) / W/nm – 0-100%



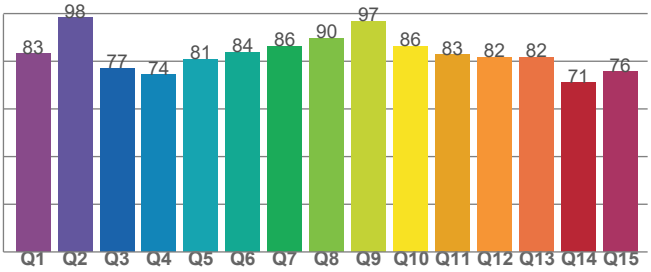

### TM30-18 Rf-values per hue bin




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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 77,2 | 85,5 | 77,8 | 87,0 | 89,4 | 94,0 | 92,9 | 89,0 | 86,6 | 77,3 | 75,8 | 89,3 | 87,4 | 84,6 | 74,8 | 84,0 |

### Color Quality Scale by reference color




CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 83,2 | 98,2 | 77,1 | 74,4 | 80,8 | 83,8 | 86,3 | 89,8 | 96,8 | 86,3 | 82,8 | 81,7 | 81,7 | 71,0 | 75,6 |

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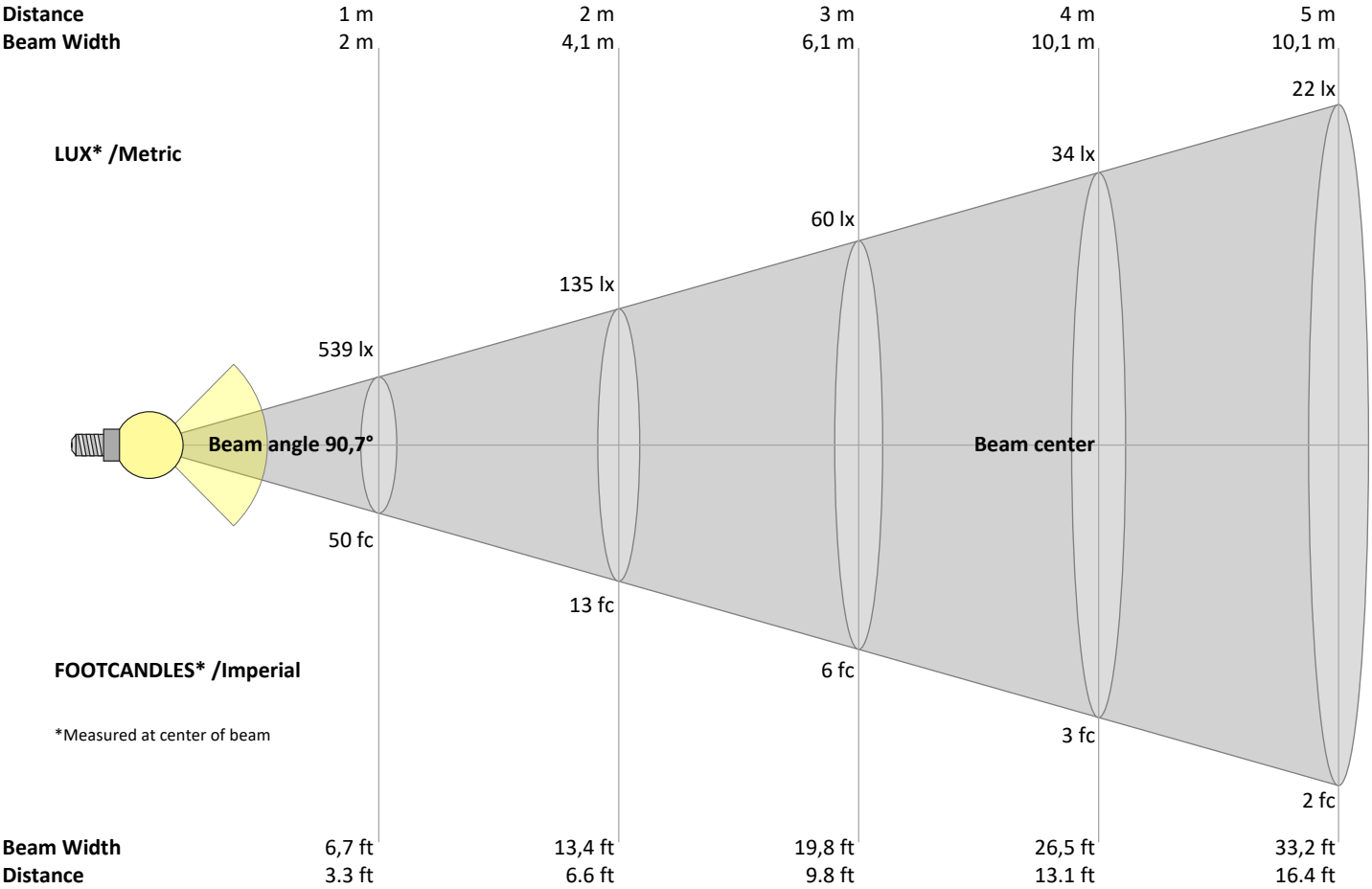
## Beam Details




### Beam intensities from 1 – 20 m

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | m |
| 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 | ft |
| 539 | 135 | 60 | 34 | 22 | 15 | 11 | 8 | 7 | 5 | 4 | 4 | 3 | 3 | 2 | 2 | 2 | 2 | 1 | 1 | lux |
| 50,1 | 12,5 | 5,6 | 3,1 | 2 | 1,4 | 1 | 0,8 | 0,6 | 0,5 | 0,4 | 0,3 | 0,3 | 0,3 | 0,2 | 0,2 | 0,2 | 0,2 | 0,1 | 0,1 | fc |

### Intensities in 0° c-plane

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° | 95° | γ |
| 539 | 539 | 527 | 509 | 484 | 450 | 411 | 368 | 322 | 273 | 223 | 174 | 125 | 80 | 42 | 15 | 2 | 0 | 0 | 0 | cd |
| 100% | 100% | 98% | 95% | 90% | 84% | 76% | 68% | 60% | 51% | 41% | 32% | 23% | 15% | 8% | 3% | 0% | 0% | 0% | 0% | of 0°val |

### Intensities in 90° c-plane

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° | 95° | γ |
| 539 | 539 | 527 | 509 | 484 | 450 | 411 | 368 | 322 | 273 | 223 | 174 | 125 | 80 | 42 | 15 | 2 | 0 | 0 | 0 | cd |
| 100% | 100% | 98% | 95% | 90% | 84% | 76% | 68% | 60% | 51% | 41% | 32% | 23% | 15% | 8% | 3% | 0% | 0% | 0% | 0% | of 0°val |

### Intensities in 180° c-plane

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° | 95° | γ |
| 539 | 539 | 527 | 509 | 484 | 450 | 411 | 368 | 322 | 273 | 223 | 174 | 125 | 80 | 42 | 15 | 2 | 0 | 0 | 0 | cd |
| 100% | 100% | 98% | 95% | 90% | 84% | 76% | 68% | 60% | 51% | 41% | 32% | 23% | 15% | 8% | 3% | 0% | 0% | 0% | 0% | of 0°val |

### Intensities in 270° c-plane

| | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° | 95° | γ |
| 539 | 539 | 527 | 509 | 484 | 450 | 411 | 368 | 322 | 273 | 223 | 174 | 125 | 80 | 42 | 15 | 2 | 0 | 0 | 0 | cd |
| 100% | 100% | 98% | 95% | 90% | 84% | 76% | 68% | 60% | 51% | 41% | 32% | 23% | 15% | 8% | 3% | 0% | 0% | 0% | 0% | of 0°val |

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## Light Planning – UGR table

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

| **Reflectances** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | ρ Ceiling | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
| | ρ Walls | 50 | 30 | 50 | 30 | 30 | 50 | 30 | 50 | 30 | 30 |
| | ρ Floor | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| **Room size** H = mounting height above eye level | | **Viewed Crosswise** (Viewing direction orthogonal to lamp length axis) | | | | | **Viewed Endwise** (Viewing direction parallel to lamp length axis) | | | | |
| **X** | **Y** | | | | | | | | | | |
| 2H | 2H | 23,7 | 24,8 | 23,9 | 25,1 | 25,3 | 23,7 | 24,8 | 23,9 | 25,1 | 25,3 |
| | 3H | 24,0 | 25,1 | 24,4 | 25,4 | 25,6 | 24,0 | 25,1 | 24,4 | 25,4 | 25,6 |
| | 4H | 24,0 | 25,1 | 24,5 | 25,3 | 25,6 | 24,0 | 25,1 | 24,5 | 25,3 | 25,6 |
| | 6H | 24,1 | 24,9 | 24,4 | 25,2 | 25,6 | 24,1 | 24,9 | 24,4 | 25,2 | 25,6 |
| | 8H | 24,0 | 24,9 | 24,3 | 25,2 | 25,6 | 24,0 | 24,9 | 24,3 | 25,2 | 25,6 |
| | 12H | 24,0 | 24,8 | 24,3 | 25,1 | 25,6 | 24,0 | 24,8 | 24,3 | 25,1 | 25,6 |
| 4H | 2H | 23,9 | 25,0 | 24,3 | 25,2 | 25,5 | 23,9 | 25,0 | 24,3 | 25,2 | 25,5 |
| | 3H | 24,5 | 25,3 | 24,8 | 25,6 | 26,1 | 24,5 | 25,3 | 24,8 | 25,6 | 26,1 |
| | 4H | 24,4 | 25,2 | 24,8 | 25,6 | 26,1 | 24,4 | 25,2 | 24,8 | 25,6 | 26,1 |
| | 6H | 24,4 | 25,1 | 24,9 | 25,4 | 25,8 | 24,4 | 25,1 | 24,9 | 25,4 | 25,8 |
| | 8H | 24,3 | 25,0 | 24,8 | 25,3 | 25,7 | 24,3 | 25,0 | 24,8 | 25,3 | 25,7 |
| | 12H | 24,3 | 24,8 | 24,8 | 25,2 | 25,7 | 24,3 | 24,8 | 24,8 | 25,2 | 25,7 |
| 8H | 4H | 24,4 | 25,0 | 24,9 | 25,4 | 25,8 | 24,4 | 25,0 | 24,9 | 25,4 | 25,8 |
| | 6H | 24,3 | 24,8 | 24,8 | 25,3 | 25,8 | 24,3 | 24,8 | 24,8 | 25,3 | 25,8 |
| | 8H | 24,3 | 24,7 | 24,8 | 25,2 | 25,9 | 24,3 | 24,7 | 24,8 | 25,2 | 25,9 |
| | 12H | 24,3 | 24,6 | 24,8 | 25,1 | 25,7 | 24,3 | 24,6 | 24,8 | 25,1 | 25,7 |
| 12H | 4H | 24,3 | 24,9 | 24,8 | 25,3 | 25,7 | 24,3 | 24,9 | 24,8 | 25,3 | 25,7 |
| | 6H | 24,3 | 24,7 | 24,8 | 25,2 | 25,9 | 24,3 | 24,7 | 24,8 | 25,2 | 25,9 |
| | 8H | 24,3 | 24,6 | 24,8 | 25,1 | 25,7 | 24,3 | 24,6 | 24,8 | 25,1 | 25,7 |

| **Variations with the observer position for the luminaire spacings, S:** | | |
|---|---|---|
| S = 1.0H | 0,3 / -0,6 | 0,3 / -0,6 |
| S = 1.5H | 0,8 / -1,7 | 0,8 / -1,7 |
| S = 2.0H | 2,0 / -3,8 | 2,0 / -3,8 |

## 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 | 111 | 107 | 104 | 101 | 108 | 105 | 102 | 99 | 101 | 98 | 96 | 97 | 95 | 93 | 93 | 92 | 90 | 88 |
| 2 | 103 | 96 | 90 | 85 | 100 | 94 | 89 | 84 | 90 | 86 | 82 | 87 | 84 | 81 | 84 | 81 | 79 | 77 |
| 3 | 95 | 86 | 79 | 73 | 92 | 84 | 78 | 72 | 81 | 76 | 71 | 79 | 74 | 70 | 76 | 72 | 69 | 67 |
| 4 | 88 | 77 | 69 | 63 | 85 | 76 | 69 | 63 | 73 | 67 | 62 | 71 | 66 | 61 | 69 | 64 | 61 | 59 |
| 5 | 81 | 70 | 62 | 56 | 79 | 68 | 61 | 55 | 66 | 60 | 55 | 65 | 59 | 54 | 63 | 58 | 54 | 52 |
| 6 | 75 | 63 | 55 | 49 | 73 | 62 | 55 | 49 | 61 | 54 | 49 | 59 | 53 | 48 | 57 | 52 | 48 | 46 |
| 7 | 70 | 58 | 50 | 44 | 68 | 57 | 49 | 44 | 55 | 49 | 44 | 54 | 48 | 43 | 53 | 47 | 43 | 41 |
| 8 | 65 | 53 | 45 | 40 | 64 | 52 | 45 | 40 | 51 | 44 | 39 | 50 | 44 | 39 | 49 | 43 | 39 | 37 |
| 9 | 61 | 49 | 41 | 36 | 60 | 48 | 41 | 36 | 47 | 41 | 36 | 46 | 40 | 36 | 45 | 40 | 35 | 34 |
| 10 | 58 | 45 | 38 | 33 | 56 | 45 | 38 | 33 | 44 | 37 | 33 | 43 | 37 | 33 | 42 | 37 | 32 | 31 |

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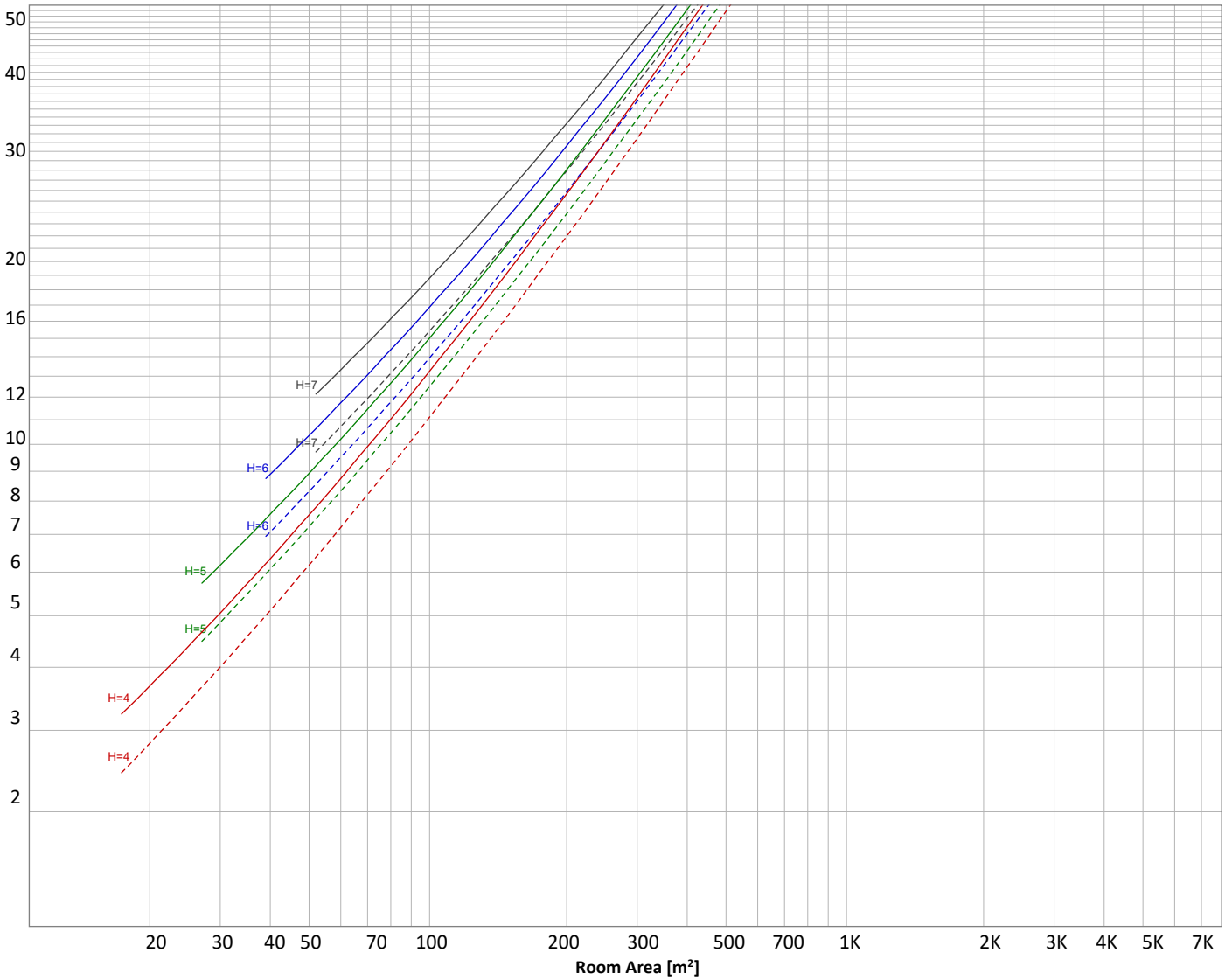
## Luminaire budgetary diagram

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

**LAMPS (number of lamps)**




**Conditions**

| | | | | | |
|---|---|---|---|---|---|
| H = Room height | Flux = 1096 lm | | ρ(%) | | |
| $H_{down}$ = Lamp distance from ceiling = | 0.00 m | Line type | Ceiling reflectance | Wall reflectance | Floor reflectance |
| $H_{work}$ = Work area height from floor = | 0.00 m | ---------- | 70 | 50 | 30 |
| $E_{work}$ = Average lux on work area = | 100 lx | ———— | 50 | 30 | 20 |

## Zonal Lumen Summary

| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|---|---|---|---|---|---|---|---|---|
| 51,0 lm | 143 lm | 207 lm | 229 lm | 210 lm | 155 lm | 80,5 lm | 18,9 lm | 0,694 lm |

| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
|---|---|---|---|---|---|---|---|---|
| 0,118 lm | 0,141 lm | 0,143 lm | 0,163 lm | 0,177 lm | 0,149 lm | 0,123 lm | 0,083 lm | 0,028 lm |

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Operator:

## Outdoor Light Planning

### Lumen per Zone

| Zone (γ) | Lumen | % Total |
|---|---|---|
| 0-10° | 51 lm | 4,6% |
| 10-20° | 143 lm | 13,1% |
| 20-30° | 207 lm | 18,8% |
| 30-40° | 229 lm | 20,9% |
| 40-50° | 210 lm | 19,2% |
| 50-60° | 155 lm | 14,1% |
| 60-70° | 81 lm | 7,3% |
| 70-80° | 19 lm | 1,7% |
| 80-90° | 1 lm | 0,1% |
| 90-100° | 0 lm | 0,0% |
| 100-110° | 0 lm | 0,0% |
| 110-120° | 0 lm | 0,0% |
| 120-130° | 0 lm | 0,0% |
| 130-140° | 0 lm | 0,0% |
| 140-150° | 0 lm | 0,0% |
| 150-160° | 0 lm | 0,0% |
| 160-170° | 0 lm | 0,0% |
| 170-180° | 0 lm | 0,0% |
| Total | 1096 lm | 100,0% |

### Intensity peaks

| | |
|---|---|
| Max intensity | 539 cd |
| Intensity, 90° | 0 cd |
| Intensity, 0° | 539 cd |

### Zonal Lumen summary

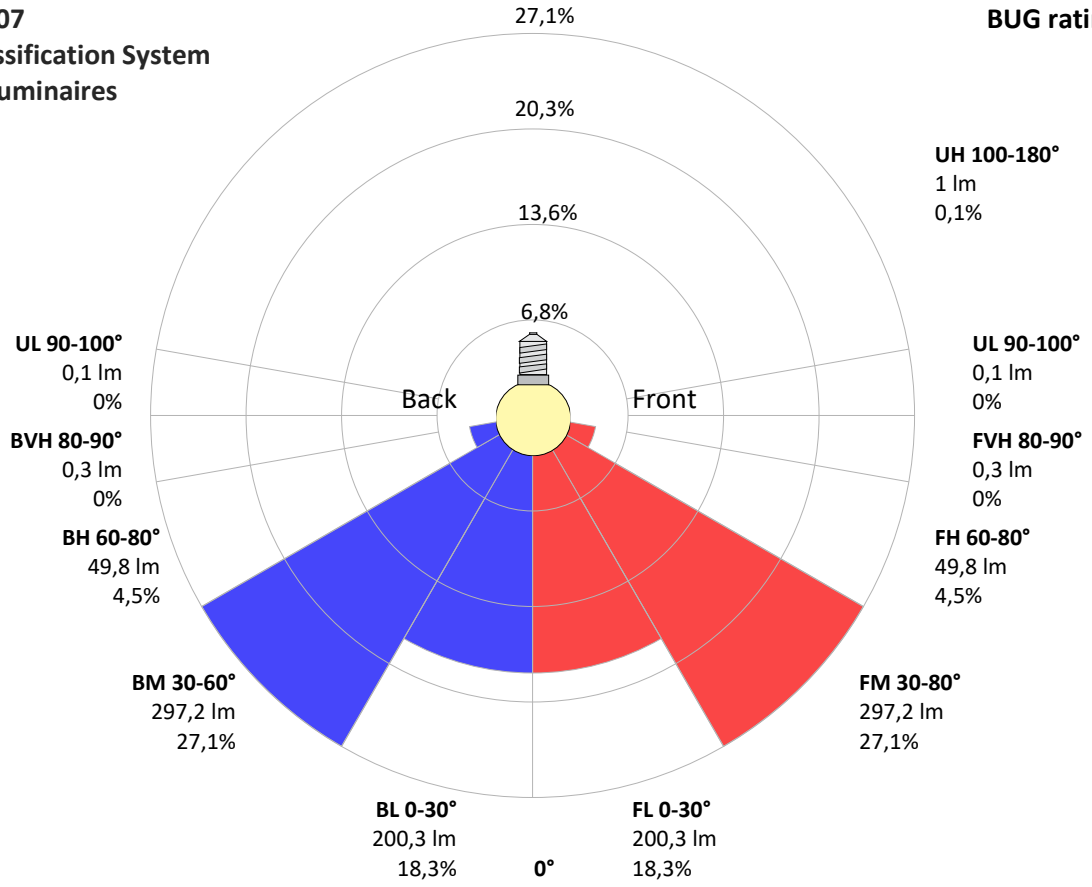
| Zone (γ) | Lumen | % Total |
|---|---|---|
| 0-30° | 401 lm | 36,6% |
| 0-40° | 630 lm | 57,5% |
| 0-60° | 995 lm | 90,8% |
| 60-90° | 100 lm | 9,1% |
| 70-100° | 20 lm | 1,8% |
| 90-120° | 0 lm | 0,0% |
| 0-90° | 1095 lm | 99,9% |
| 90-180° | 1 lm | 0,1% |
| 0-180° | 1096 lm | 100,0% |

### BUG rating

| | Lumen | % Total |
|---|---|---|
| **Forward light** | | |
| Low(0-30°) | 200 lm | 18,3% |
| Medium(30-60°) | 297 lm | 27,1% |
| High(60-80°) | 50 lm | 4,5% |
| Very high(80-90°) | 0 lm | 0,0% |
| **Back light** | | |
| Low(0-30°) | 200 lm | 18,3% |
| Medium(30-60°) | 297 lm | 27,1% |
| High(60-80°) | 50 lm | 4,5% |
| Very high(80-90°) | 0 lm | 0,0% |
| **Uplight** | | |
| Low(90-100°) | 0 lm | 0,0% |
| High(100-180°) | 1 lm | 0,1% |

**IESNA TM-15-07**
**Luminaire Classification System**
**For Outdoor Luminaires**

**BUG rating B1 U1 G0**



# Light Measurement Report

Print date: 21-10-2024
Measurement date and time: 21-10-2024 16:14:14 – Measurement no. VFR-241021-1468-MS
Measurement tracking No. and Link: VT241021-004470
Operator:

## Power Details

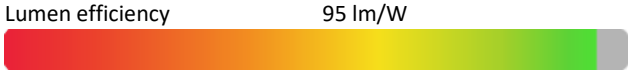
### Input Power

| | |
|---|---|
| Power feed to light source | 11,5 W |
| Frequency of input power | 50 Hz |
| RMS Input voltage feed, $V_{RMS}$ | 230 V |
| RMS Input current feed, $I_{RMS}$ | 0,053 A |
| Volt-Ampere or apparent power = $V_{RMS}*I_{RMS}$ | 12,28 VA |
| Displacement factor of AC power feed | 0,95 |
| Power factor of AC current feed | 0,94 |
| Total harmonic distortion of the current | 14,74% |
| Total harmonic distortion of the voltage | 0,07% |

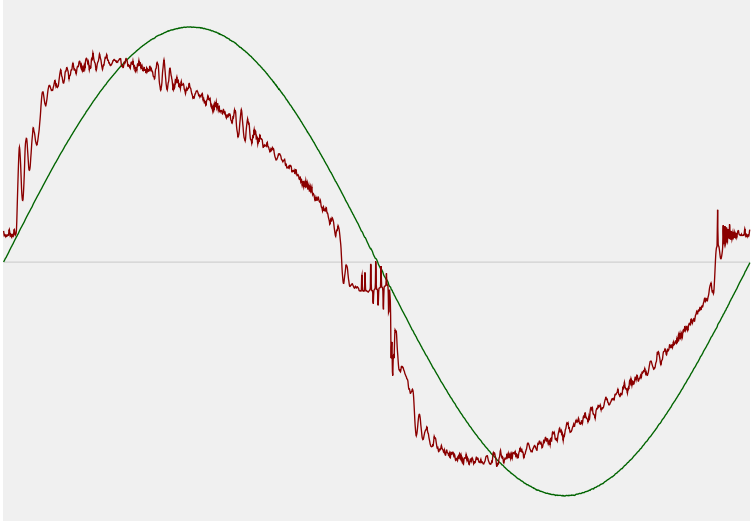
### Efficiency

Radiated power efficiency 29,6%

Lumen efficiency 95 lm/W



### Input Power Curve



## Stabilization Details

### Warmup Conditions

| | |
|---|---|
| Stable period | 15 min |
| Stable change max | 2,0% |
| Minimum time | 15 min |

### Warmup Result

| | |
|---|---|
| Total warmup time | Lamp stabilized in 15 min 0 sec |
| Warmup variation | -0,6% |

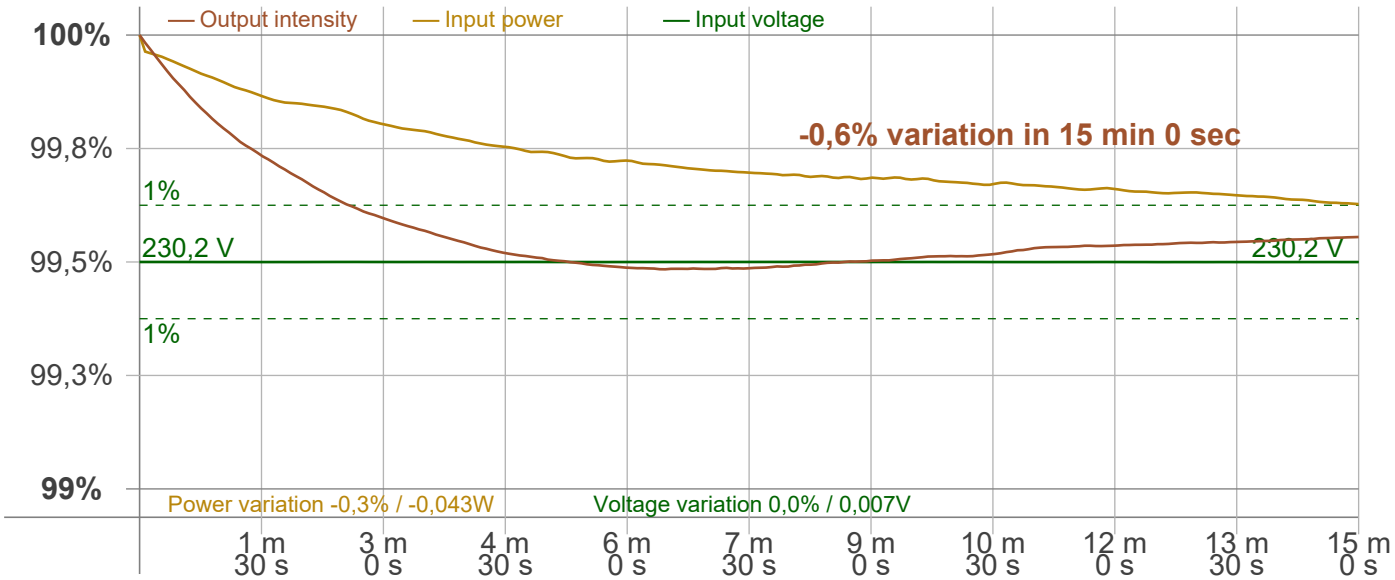
### Color Temperature Change

| | |
|---|---|
| CCT start | 4977 K |
| CCT shift | +23 K |
| CCT end | 5000 K |

### Output Change

| | |
|---|---|
| Output start | 1102 lm |
| Output change | -5 lm |
| Output end | 1096 lm |

### Stabilization Curve



# Light Measurement Report

Print date: 21-10-2024
Measurement date and time: 21-10-2024 16:14:14 – Measurement no. VFR-241021-1468-MS
Measurement tracking No. and Link: VT241021-004470
Operator:

## Flicker /TLA details

| | |
|---|---|
| Flicker Meter Type | Viso Systems LabFlicker |
| Frequency of input power | 50 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 | 100 Hz |
| Percent Flicker | 22,96 % |
| Flicker index | 0,07 |

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

| | |
|---|---|
| PstLM value (F < 80 Hz) | 0,02 |
| SVM value (80 < F < 2000 Hz) | 0,88 |

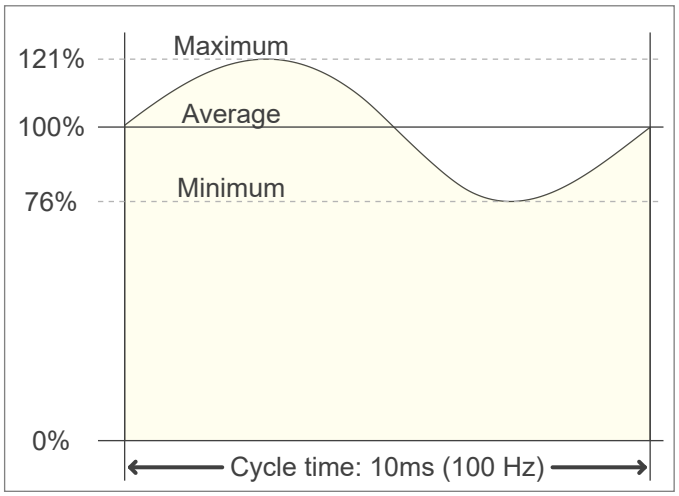
**Flicker indices according to California Energy Commission (CEC) 2016b**

| | |
|---|---|
| JA8/10 40 Hz | 0,05 % |
| JA8/10 90 Hz | 0,2 % |
| JA8/10 200 Hz | 22,93 % |
| JA8/10 400 Hz | 22,99 % |
| JA8/10 1000 Hz | 22,96 % |

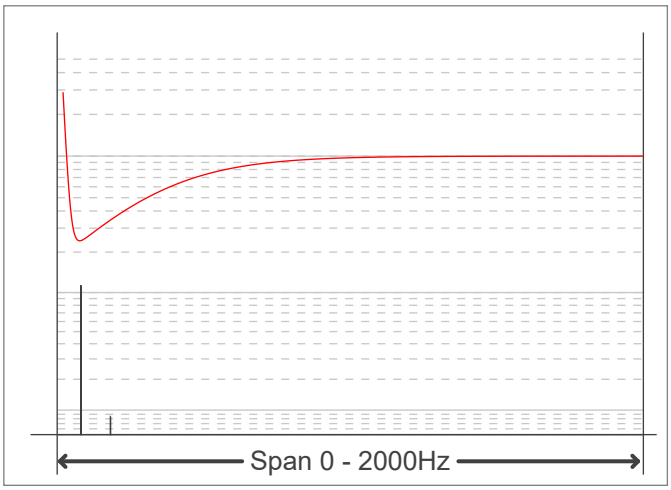
**Flicker indices according to Lighting Research Center (2015)**

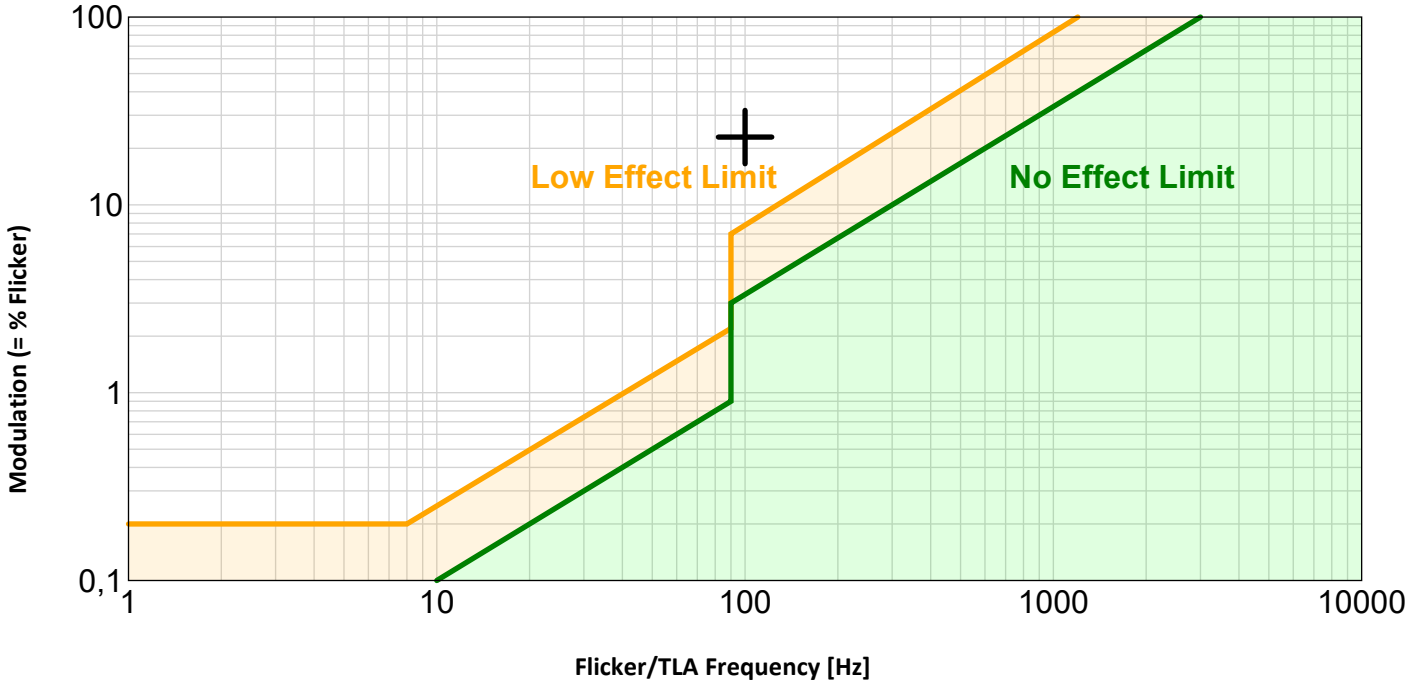
| | |
|---|---|
| Perception metric, Assist Mp | 0,01 |

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




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




**IEEE 1789 Frequency/modulation plot**