

Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](#)

Operator:



Laboratory and Equipment

Laboratory Owner and Location
Goniospectrometer System and Type
Sensor Name, Calibr. Date and Serial No.
Spectrometer Manufacturer and Model

Viso Systems, Copenhagen V, Denmark
LabSpion – Type C, horizontal
LabSensor Model2 – 11-1-2024 – 3130191315
Ibsen Photonics, Denmark – Freedom VIS (Custom Viso)

Measurement Conditions

Number of C-planes and Resolution
 γ (gamma)-Resolution
Test Distance
Input Power, Power and Displ. Factors
Input RMS Voltage and Current
Frequency of Input Power
Warm-up Time and Variation

16 planes – 22,5°
5°
12,13 m
57,3 W – PF 0,98 – DPF 0,98
230 V – 0,254 A
50 Hz
Lamp stabilized in 15 min 1 sec – 2,0%

Tested Light Source

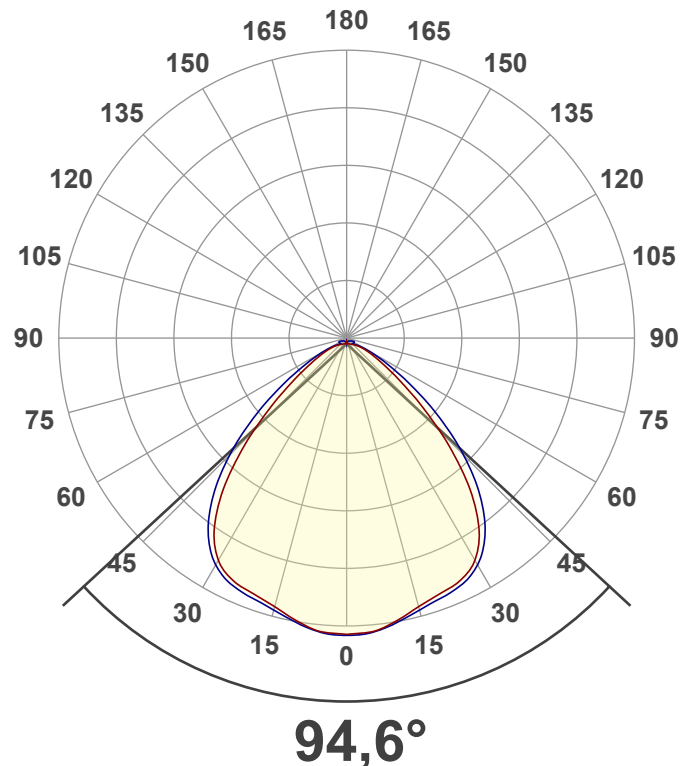
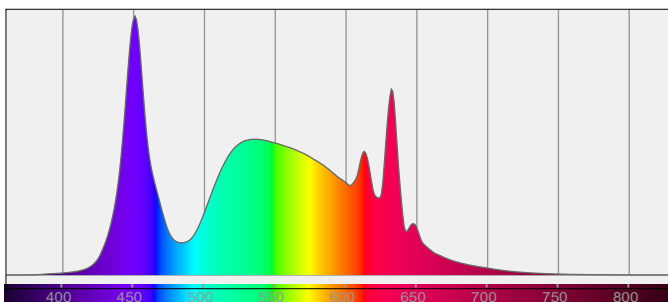
Product Name
Item No. and Manufacturer
Product Description (line 1)

274471-5700K
274471-5700K – Dutchfulfillment
RETROFIT TITAN | LED MODULE | 32W/40W/48W/56W | 90°

Main Light Measurement Results

Output – Total Lumen (Up% / Down%)
Efficiency
Peak Intensity and Beam Angle
Correlated Color Temperature, Target/Measured
Color Rendering Index
Color Rendering TM30-18
Color Shift, CIE duv and MacAdam Steps
Flicker

10320 lm – 3,35% / 96,65%
180 lm/W
4489 cd – 94,6°
CCT = 5700 K / 5615 K
CRI 82,3
 R_f 82,2 – R_g 98,9
Duv 0,0032 – SDCM 8,8
SVM 0 – PstLM 0,02



Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

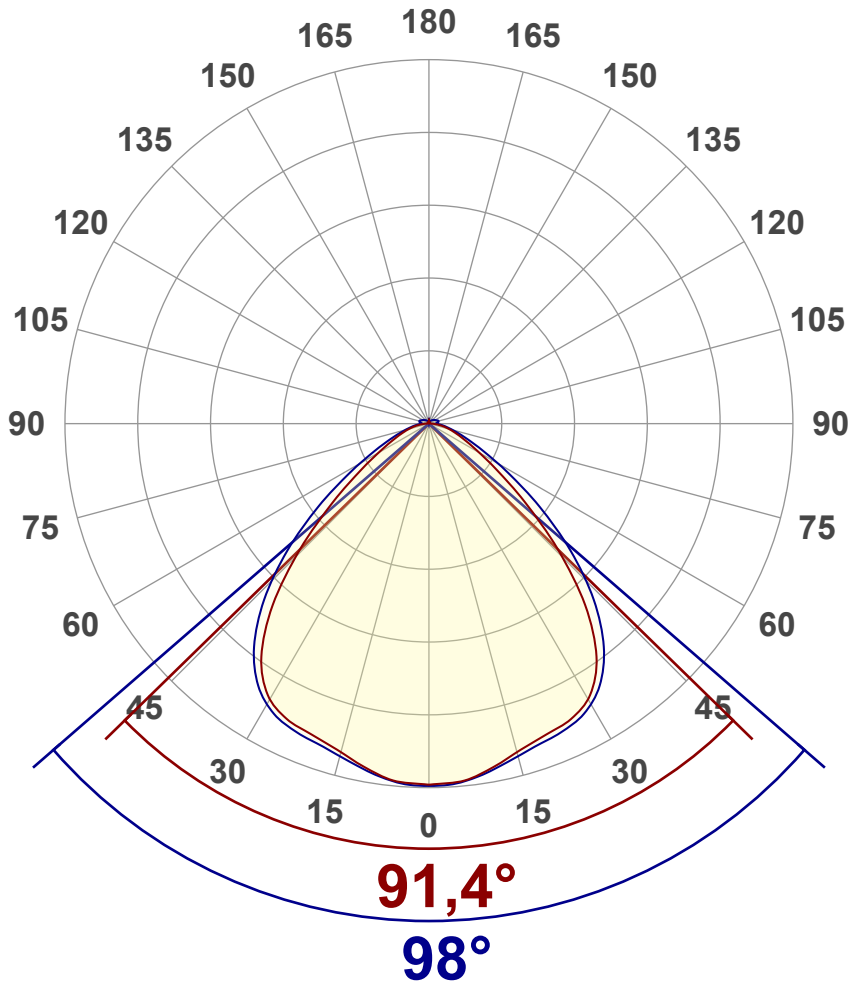
Measurement tracking No. and Link: [VT241014-004577](#)

Operator:



Luminous Intensity diagram

Unit: 0-100% of peak intensity



Main Values

| | |
|----------------------|----------------|
| Output (total Lumen) | 10320 lm |
| Lumen Up% / Down% | 3,35% / 96,65% |
| Peak Intensity | 4489 cd |
| Beam Angle (50%) | 94,6° |
| Beam Angle (90%) | 98° |
| Beam Angle (10%) | 91,4° |

Cut-off Angle

| | |
|--------------|--------|
| Average 2,5% | 188,9° |
|--------------|--------|

Field Angle

| | |
|-------------|--------|
| Average 10% | 137,8° |
|-------------|--------|

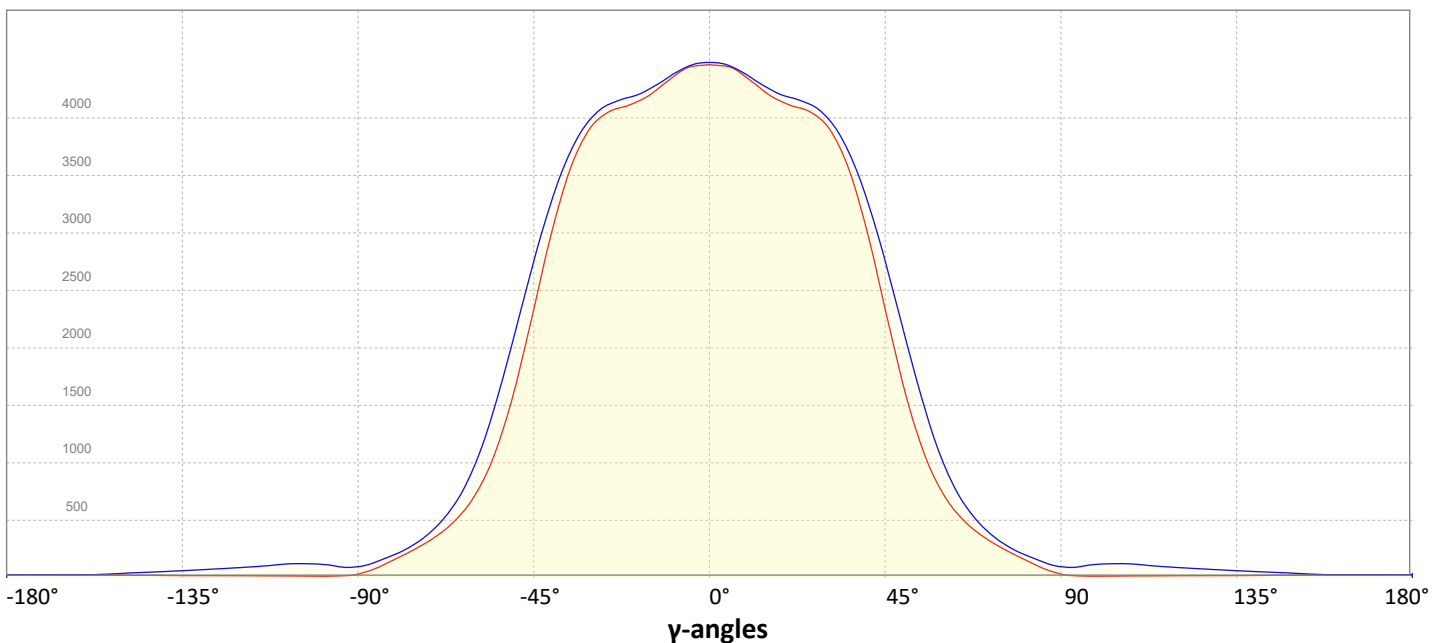
Intensity Ratio

| | |
|--------------|-------|
| In 120° cone | 86,4% |
| In 90° cone | 66,4% |

C000-C180

C090-C270

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



Light Measurement Report

Print date: 14-10-2024

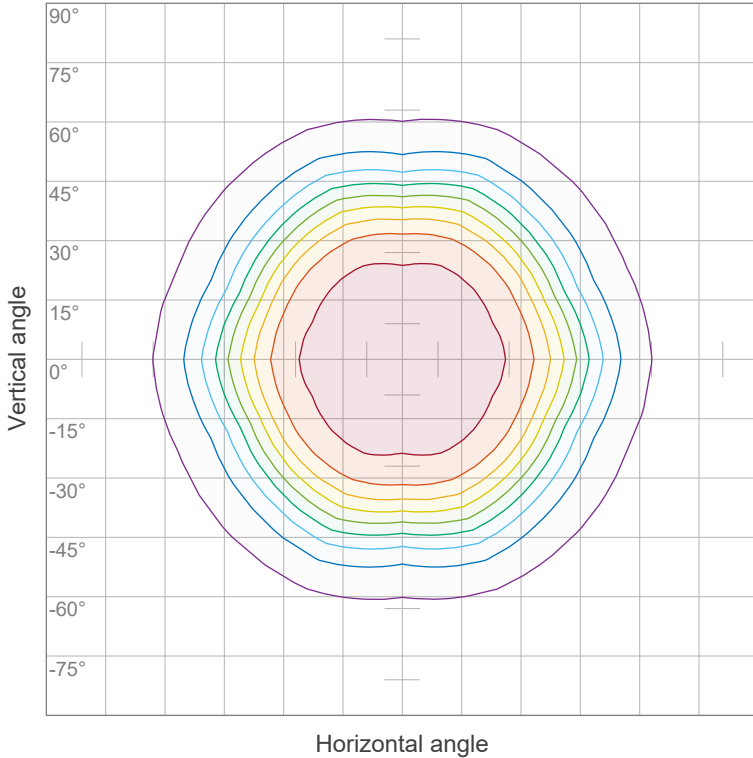
Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](https://www.viso-systems.com/VT241014-004577)

Operator:



Iso-intensity Diagram (Iso-candela)

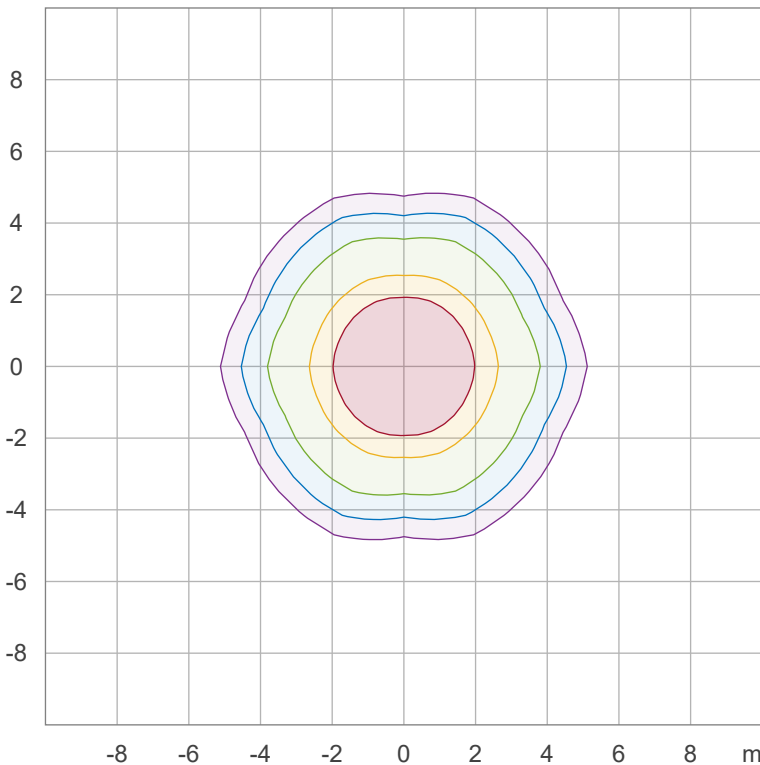


| | |
|------|-----------|
| 90 % | 4034,1 cd |
| 80 % | 3585,9 cd |
| 70 % | 3137,6 cd |
| 60 % | 2689,4 cd |
| 50 % | 2241,2 cd |
| 40 % | 1792,9 cd |
| 30 % | 1344,7 cd |
| 20 % | 896,5 cd |
| 10 % | 448,2 cd |

Peak intensity: 4482,3 cd

Number of c-planes: 16

Iso-illuminance Diagram (Iso-lux)



| | |
|--------|----------|
| 50,0 % | 248,9 lx |
| 30,0 % | 149,3 lx |
| 10,0 % | 49,8 lx |
| 5,0 % | 24,9 lx |
| 3,0 % | 14,9 lx |

Peak illuminance: 497,8 lx

Mounting height: 3,0 m

Number of c-planes: 16

Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](#)

Operator:

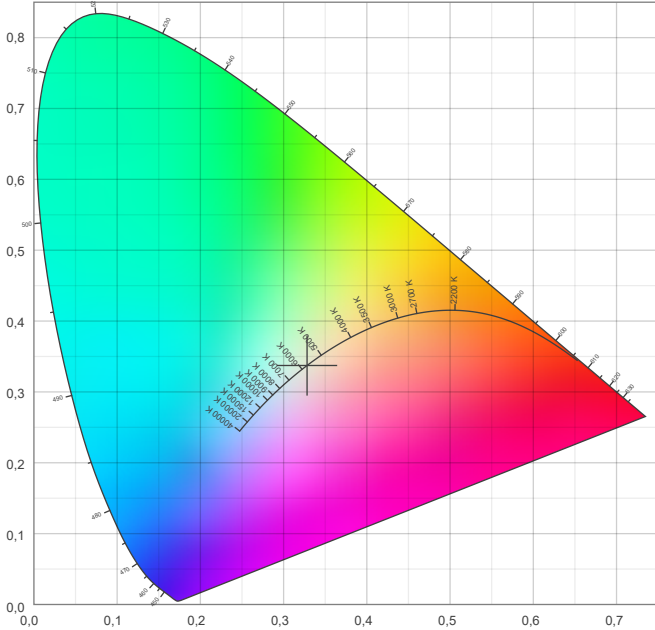


Color details

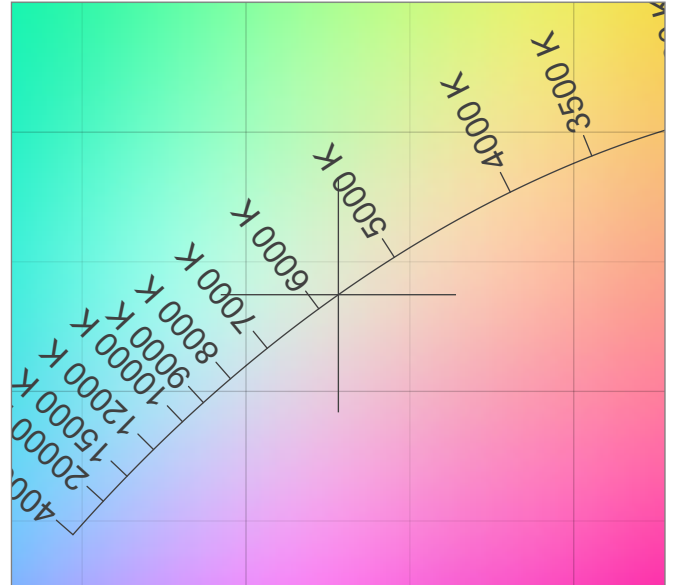
Correlated Color Temperature, Target CCT = 5700 K
 Correlated Color Temperature, Measured CCT = 5615 K
 Color Rendering Index CRI 82,3
 Color Rendering Index, R9 (red component) R9 = 38,6
 Color Rendering TM30-18 R_f 82,2 – R_g 98,9
 Color Quality Scale CQS = 82,1

MacAdam Steps SDCM = 8,8
 Color coordinates CIE 1931 (x;y) = (0,328;0,337)
 Color coordinate CIEs 1960 (u;v) = (0,205;0,317)
 Color deviation from BBL Duv = 0,0032
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,205;0,475)

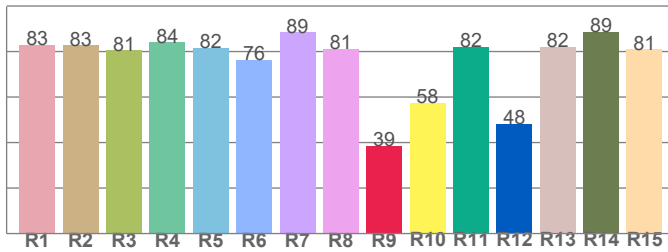
CIE 1931



CIE 1931 – zoomed on Planckian locus



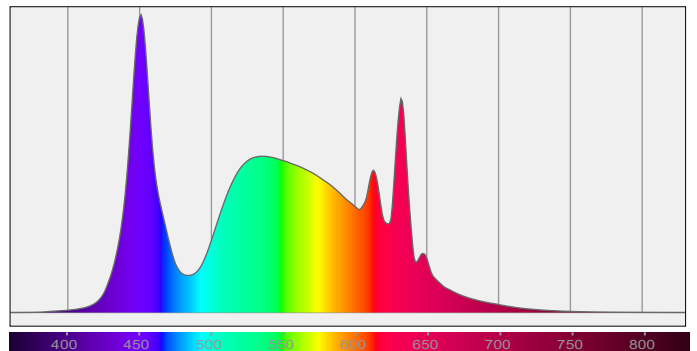
Color Rendering Index per reference color (CIE 1995)



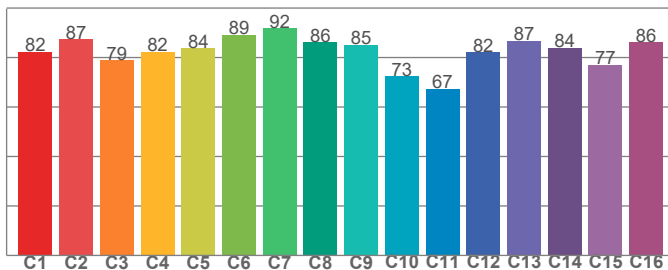
CRI R values, only R1-R8 are used to calculate final CRI value

| R1 | R2 | R3 | R4 | R5 | R6 | R7 | R8 | R9 | R10 | R11 | R12 | R13 | R14 | R15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 83,0 | 82,8 | 80,6 | 84,0 | 81,7 | 76,4 | 88,6 | 81,2 | 38,6 | 57,6 | 82,1 | 48,3 | 82,1 | 88,8 | 81,0 |

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



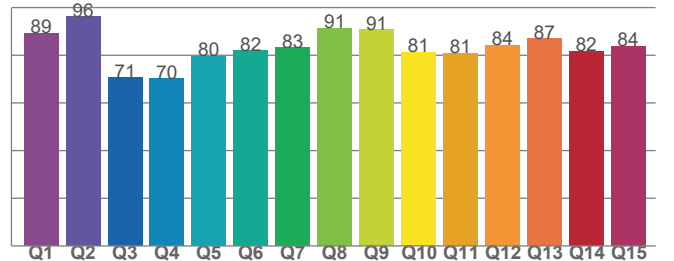
TM30-18 Rf-values per hue bin



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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 82,3 | 87,4 | 78,9 | 82,3 | 83,7 | 89,2 | 91,8 | 86,3 | 85,1 | 72,5 | 67,4 | 82,2 | 86,8 | 84,0 | 77,0 | 86,2 |

Color Quality Scale by reference color



CQS Q values

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 89,3 | 96,2 | 70,5 | 70,1 | 79,5 | 81,9 | 83,2 | 91,5 | 90,7 | 81,2 | 80,9 | 84,1 | 86,9 | 81,6 | 83,9 |

Light Measurement Report

Print date: 14-10-2024

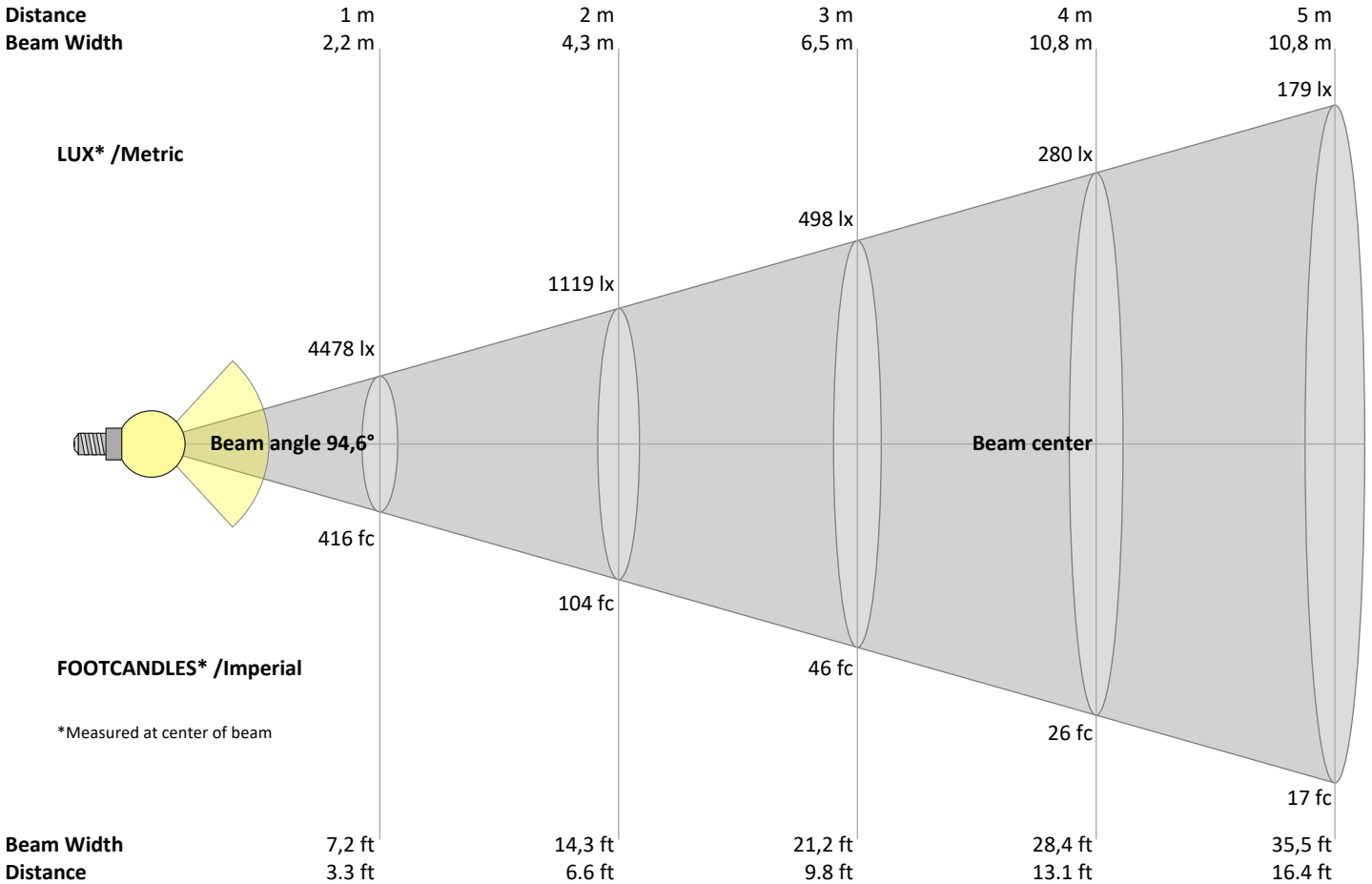
Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](https://www.viso-systems.com/VT241014-004577)

Operator:



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 |
| 4478 | 1119 | 498 | 280 | 179 | 124 | 91 | 70 | 55 | 45 | 37 | 31 | 26 | 23 | 20 | 17 | 15 | 14 | 12 | 11 | lux |
| 416 | 104 | 46,2 | 26 | 16,6 | 11,6 | 8,5 | 6,5 | 5,1 | 4,2 | 3,4 | 2,9 | 2,5 | 2,1 | 1,8 | 1,6 | 1,4 | 1,3 | 1,2 | 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 |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 4478 | 4440 | 4337 | 4209 | 4122 | 4062 | 3925 | 3601 | 3048 | 2335 | 1634 | 1089 | 730 | 507 | 363 | 258 | 170 | 90 | 34 | 16 | cd |
| 100% | 99% | 97% | 94% | 92% | 91% | 88% | 80% | 68% | 52% | 36% | 24% | 16% | 11% | 8% | 6% | 4% | 2% | 1% | 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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|----------|
| 4478 | 4448 | 4364 | 4262 | 4186 | 4122 | 3993 | 3730 | 3307 | 2745 | 2111 | 1501 | 1007 | 668 | 451 | 309 | 214 | 145 | 101 | 99 | cd |
| 100% | 99% | 97% | 95% | 93% | 92% | 89% | 83% | 74% | 61% | 47% | 34% | 22% | 15% | 10% | 7% | 5% | 3% | 2% | 2% | 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 |
|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 4478 | 4440 | 4337 | 4209 | 4122 | 4062 | 3925 | 3601 | 3048 | 2335 | 1634 | 1089 | 730 | 507 | 363 | 258 | 170 | 90 | 34 | 16 | cd |
| 100% | 99% | 97% | 94% | 92% | 91% | 88% | 80% | 68% | 52% | 36% | 24% | 16% | 11% | 8% | 6% | 4% | 2% | 1% | 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 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|----------|
| 4478 | 4448 | 4364 | 4262 | 4186 | 4122 | 3993 | 3730 | 3307 | 2745 | 2111 | 1501 | 1007 | 668 | 451 | 309 | 214 | 145 | 101 | 99 | cd |
| 100% | 99% | 97% | 95% | 93% | 92% | 89% | 83% | 74% | 61% | 47% | 34% | 22% | 15% | 10% | 7% | 5% | 3% | 2% | 2% | of 0°val |

Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](https://vt241014-004577)

Operator:



Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

| Reflectances | | 70 | 70 | 50 | 50 | 30 | 70 | 70 | 50 | 50 | 30 |
|-------------------------------------|-----------|--|------|------|------|------|--|------|------|------|------|
| | 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 | | Viewed Crosswise | | | | | Viewed Endwise | | | | |
| H = mounting height above eye level | | (Viewing direction orthogonal to lamp length axis) | | | | | (Viewing direction parallel to lamp length axis) | | | | |
| X | Y | | | | | | | | | | |
| 2H | 2H | 23,1 | 24,2 | 23,4 | 24,5 | 24,8 | 22,7 | 23,7 | 22,9 | 24,0 | 24,3 |
| | 3H | 23,5 | 24,6 | 23,9 | 24,9 | 25,1 | 23,0 | 24,1 | 23,5 | 24,4 | 24,6 |
| | 4H | 23,7 | 24,7 | 24,1 | 25,0 | 25,3 | 23,2 | 24,2 | 23,6 | 24,5 | 24,8 |
| | 6H | 23,9 | 24,8 | 24,3 | 25,1 | 25,6 | 23,4 | 24,3 | 23,8 | 24,6 | 25,1 |
| | 8H | 24,0 | 24,8 | 24,4 | 25,2 | 25,7 | 23,5 | 24,3 | 23,9 | 24,7 | 25,2 |
| | 12H | 24,0 | 24,8 | 24,4 | 25,2 | 25,7 | 23,5 | 24,4 | 23,9 | 24,7 | 25,2 |
| 4H | 2H | 23,2 | 24,2 | 23,6 | 24,5 | 24,8 | 22,8 | 23,8 | 23,2 | 24,1 | 24,4 |
| | 3H | 23,8 | 24,7 | 24,3 | 25,1 | 25,6 | 23,4 | 24,2 | 23,8 | 24,6 | 25,1 |
| | 4H | 24,1 | 24,9 | 24,6 | 25,3 | 25,9 | 23,6 | 24,4 | 24,1 | 24,8 | 25,4 |
| | 6H | 24,4 | 25,1 | 24,9 | 25,5 | 25,9 | 23,9 | 24,6 | 24,4 | 25,0 | 25,4 |
| | 8H | 24,5 | 25,1 | 25,0 | 25,6 | 26,0 | 24,0 | 24,7 | 24,5 | 25,1 | 25,5 |
| | 12H | 24,6 | 25,1 | 25,1 | 25,6 | 26,1 | 24,1 | 24,6 | 24,6 | 25,1 | 25,6 |
| 8H | 4H | 24,1 | 24,8 | 24,7 | 25,2 | 25,7 | 23,7 | 24,4 | 24,3 | 24,8 | 25,2 |
| | 6H | 24,6 | 25,1 | 25,1 | 25,6 | 26,2 | 24,1 | 24,6 | 24,7 | 25,1 | 25,7 |
| | 8H | 24,8 | 25,2 | 25,3 | 25,8 | 26,5 | 24,3 | 24,7 | 24,9 | 25,3 | 26,0 |
| | 12H | 24,9 | 25,3 | 25,6 | 25,9 | 26,5 | 24,5 | 24,9 | 25,1 | 25,4 | 26,1 |
| 12H | 4H | 24,1 | 24,7 | 24,7 | 25,2 | 25,7 | 23,7 | 24,2 | 24,2 | 24,7 | 25,2 |
| | 6H | 24,6 | 25,0 | 25,2 | 25,6 | 26,3 | 24,2 | 24,6 | 24,7 | 25,2 | 25,8 |
| | 8H | 24,8 | 25,2 | 25,5 | 25,7 | 26,4 | 24,4 | 24,7 | 25,0 | 25,3 | 26,0 |

Variations with the observer position for the luminaire spacings, S:

| | | |
|----------|------------|------------|
| S = 1.0H | 0,4 / -0,6 | 0,4 / -0,6 |
| S = 1.5H | 1,0 / -1,3 | 1,2 / -1,3 |
| S = 2.0H | 1,9 / -1,9 | 2,2 / -1,9 |

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 | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 109 | 109 | 109 | 104 | 104 | 104 | 99 | 99 | 99 | 97 |
| 1 | 110 | 106 | 102 | 99 | 107 | 103 | 100 | 97 | 98 | 95 | 93 | 94 | 92 | 90 | 90 | 88 | 86 | 84 |
| 2 | 101 | 94 | 88 | 83 | 98 | 92 | 87 | 82 | 88 | 83 | 80 | 84 | 81 | 77 | 81 | 78 | 75 | 73 |
| 3 | 93 | 84 | 77 | 71 | 91 | 82 | 76 | 70 | 79 | 73 | 69 | 76 | 71 | 67 | 73 | 69 | 66 | 64 |
| 4 | 86 | 76 | 68 | 62 | 84 | 74 | 67 | 61 | 71 | 65 | 60 | 69 | 63 | 59 | 66 | 62 | 58 | 56 |
| 5 | 80 | 68 | 60 | 54 | 78 | 67 | 60 | 54 | 65 | 58 | 53 | 62 | 57 | 52 | 60 | 55 | 51 | 49 |
| 6 | 74 | 62 | 54 | 48 | 72 | 61 | 53 | 48 | 59 | 52 | 47 | 57 | 51 | 47 | 55 | 50 | 46 | 44 |
| 7 | 69 | 57 | 49 | 43 | 67 | 56 | 48 | 43 | 54 | 47 | 42 | 52 | 46 | 42 | 51 | 45 | 41 | 39 |
| 8 | 64 | 52 | 44 | 39 | 63 | 51 | 44 | 38 | 50 | 43 | 38 | 48 | 42 | 38 | 47 | 41 | 37 | 35 |
| 9 | 60 | 48 | 40 | 35 | 59 | 47 | 40 | 35 | 46 | 39 | 35 | 45 | 39 | 34 | 43 | 38 | 34 | 32 |
| 10 | 57 | 44 | 37 | 32 | 55 | 44 | 37 | 32 | 42 | 36 | 31 | 41 | 35 | 31 | 40 | 35 | 31 | 29 |

Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](#)

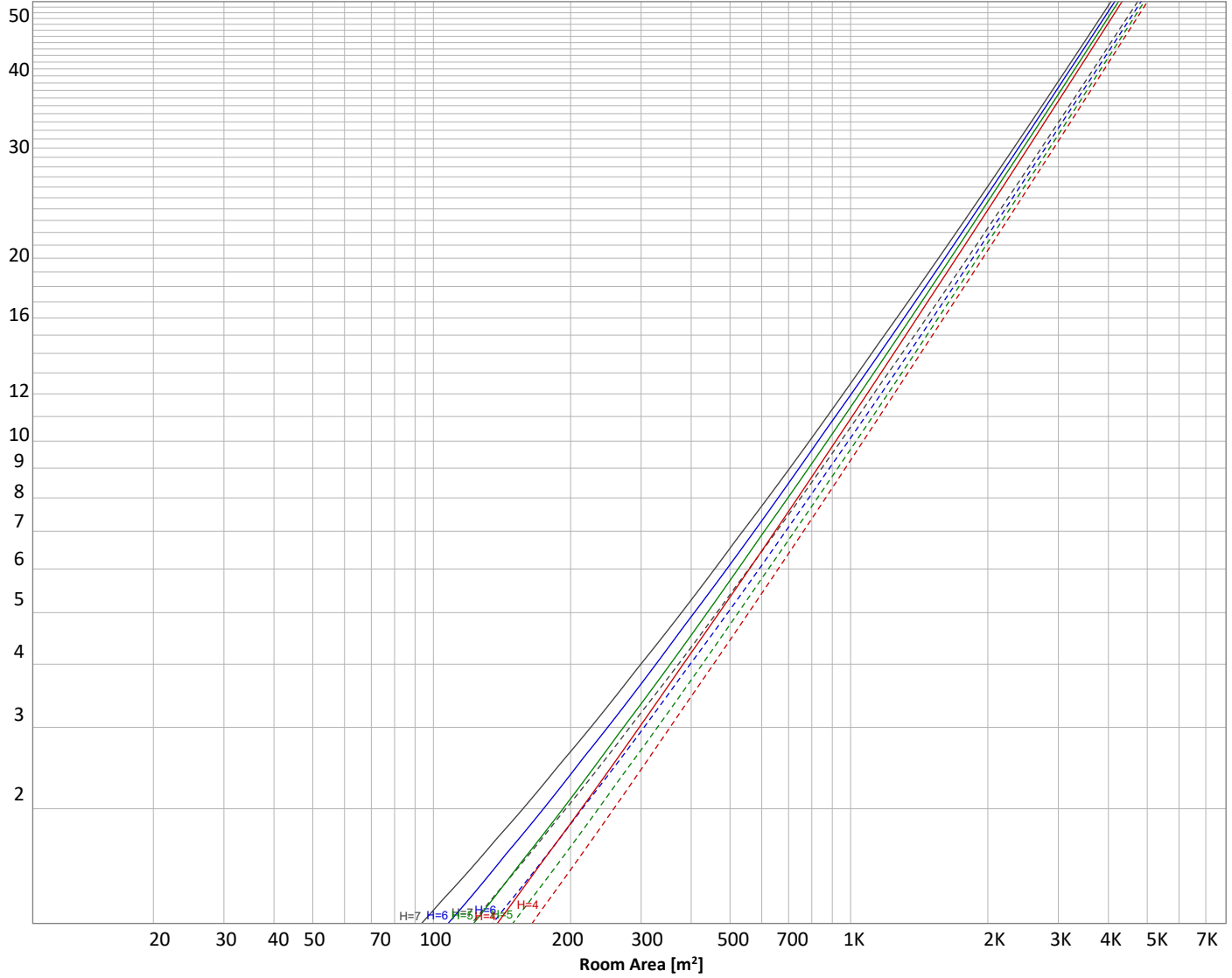
Operator:



Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



Conditions

| | | | | |
|---|-----------------|-----------|---------------------|--------------------------|
| H = Room height | Flux = 10320 lm | | | |
| H _{down} = Lamp distance from ceiling = | 0.00 m | Line type | Ceiling reflectance | ρ(%) Wall reflectance |
| H _{work} = Work area height from floor = | 0.00 m | ----- | 70 | 50 |
| E _{work} = 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° |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 422 lm | 1199 lm | 1890 lm | 2282 lm | 1952 lm | 1168 lm | 597 lm | 316 lm | 148 lm |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 77,1 lm | 82,8 lm | 65,3 lm | 47,1 lm | 31,8 lm | 20,1 lm | 12,0 lm | 7,12 lm | 2,48 lm |

Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](#)

Operator:



Outdoor Light Planning

Lumen per Zone

| Zone (γ) | Lumen | % Total |
|--------------|-----------------|---------------|
| 0-10° | 422 lm | 4,1% |
| 10-20° | 1199 lm | 11,6% |
| 20-30° | 1890 lm | 18,3% |
| 30-40° | 2282 lm | 22,1% |
| 40-50° | 1952 lm | 18,9% |
| 50-60° | 1168 lm | 11,3% |
| 60-70° | 597 lm | 5,8% |
| 70-80° | 316 lm | 3,1% |
| 80-90° | 148 lm | 1,4% |
| 90-100° | 77 lm | 0,7% |
| 100-110° | 83 lm | 0,8% |
| 110-120° | 65 lm | 0,6% |
| 120-130° | 47 lm | 0,5% |
| 130-140° | 32 lm | 0,3% |
| 140-150° | 20 lm | 0,2% |
| 150-160° | 12 lm | 0,1% |
| 160-170° | 7 lm | 0,1% |
| 170-180° | 2 lm | 0,0% |
| Total | 10320 lm | 100,0% |

Intensity peaks

| | |
|----------------|---------|
| Max intensity | 4489 cd |
| Intensity, 90° | 34 cd |
| Intensity, 0° | 4478 cd |

Zonal Lumen summary

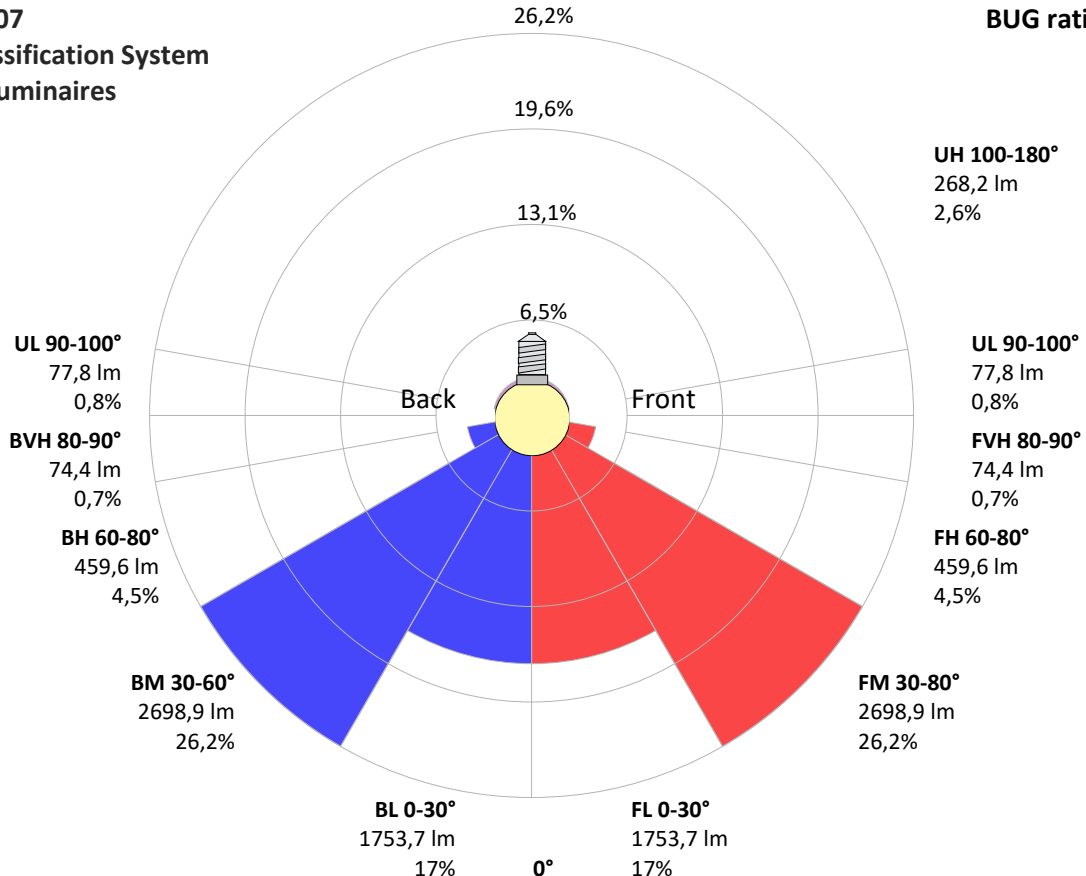
| Zone (γ) | Lumen | % Total |
|----------|----------|---------|
| 0-30° | 3511 lm | 34,0% |
| 0-40° | 5792 lm | 56,1% |
| 0-60° | 8913 lm | 86,4% |
| 60-90° | 1061 lm | 10,3% |
| 70-100° | 541 lm | 5,2% |
| 90-120° | 225 lm | 2,2% |
| 0-90° | 9974 lm | 96,6% |
| 90-180° | 346 lm | 3,4% |
| 0-180° | 10320 lm | 100,0% |

BUG rating

| | Lumen | % Total |
|----------------------|---------|---------|
| Forward light | | |
| Low(0-30°) | 1754 lm | 17,0% |
| Medium(30-60°) | 2699 lm | 26,2% |
| High(60-80°) | 460 lm | 4,5% |
| Very high(80-90°) | 74 lm | 0,7% |
| Back light | | |
| Low(0-30°) | 1754 lm | 17,0% |
| Medium(30-60°) | 2699 lm | 26,2% |
| High(60-80°) | 460 lm | 4,5% |
| Very high(80-90°) | 74 lm | 0,7% |
| Uplight | | |
| Low(90-100°) | 78 lm | 0,8% |
| High(100-180°) | 268 lm | 2,6% |

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

BUG rating B3 U3 G1



Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](#)

Operator:

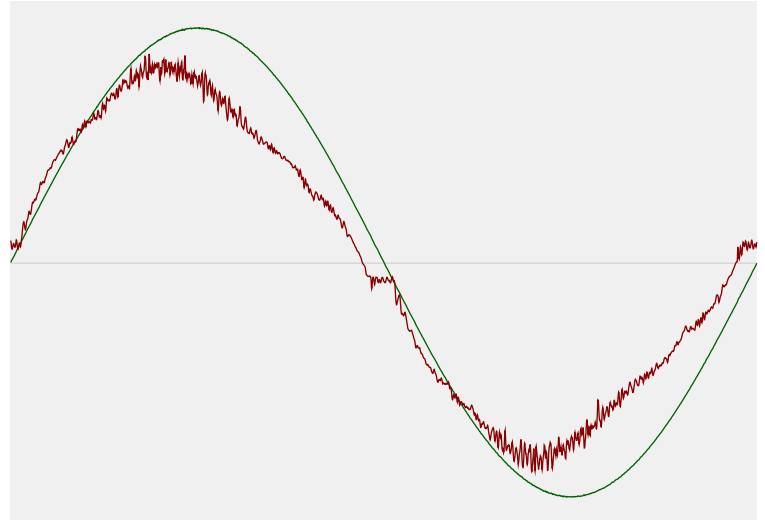


Power Details

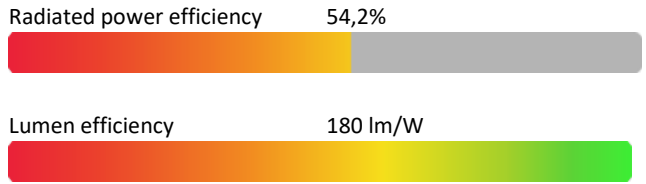
Input Power

| | |
|---|----------|
| Power feed to light source | 57,3 W |
| Frequency of input power | 50 Hz |
| RMS Input voltage feed, V_{RMS} | 230 V |
| RMS Input current feed, I_{RMS} | 0,254 A |
| Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$ | 58,37 VA |
| Displacement factor of AC power feed | 0,98 |
| Power factor of AC current feed | 0,98 |
| Total harmonic distortion of the current | 7,48% |
| Total harmonic distortion of the voltage | 0,07% |

Input Power Curve



Efficiency



Stabilization Details

Warmup Conditions

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

Color Temperature Change

| | |
|-----------|--------|
| CCT start | 5704 K |
| CCT shift | -4 K |
| CCT end | 5700 K |

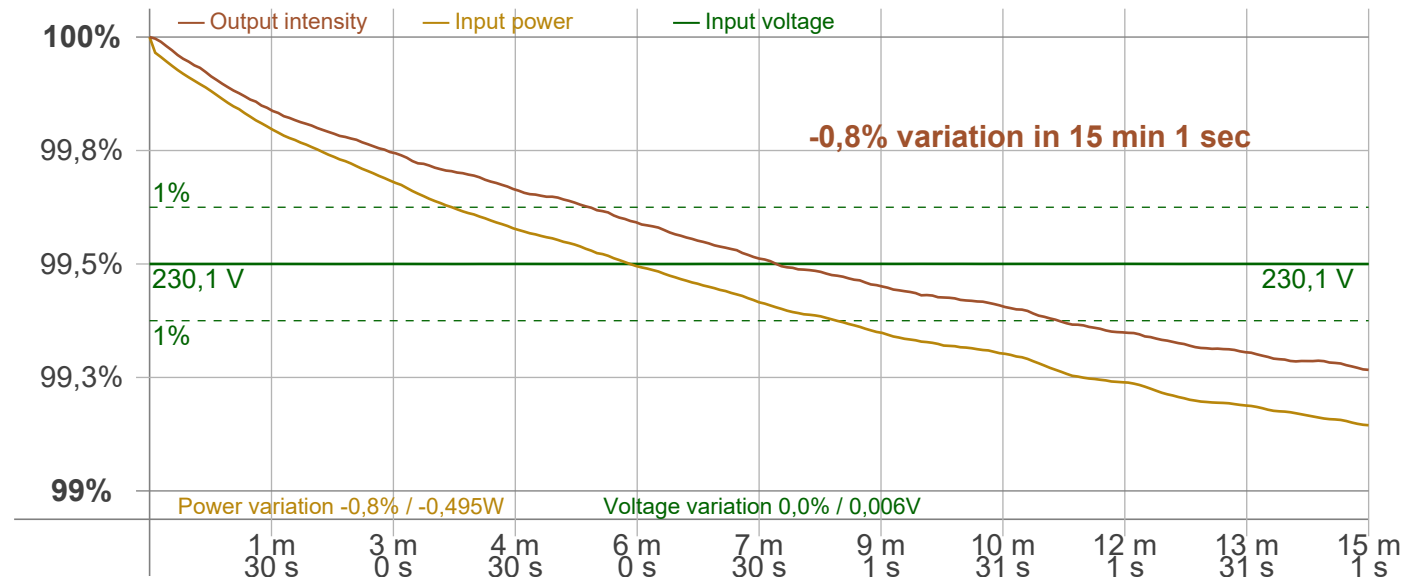
Warmup Result

| | |
|-------------------|---------------------------------|
| Total warmup time | Lamp stabilized in 15 min 1 sec |
| Warmup variation | -0,8% |

Output Change

| | |
|---------------|----------|
| Output start | 10397 lm |
| Output change | -77 lm |
| Output end | 10320 lm |

Stabilization Curve



Light Measurement Report

Print date: 14-10-2024

Measurement date and time: 14-10-2024 16:04:20 – Measurement no. VFR-241014-1256-MS

Measurement tracking No. and Link: [VT241014-004577](https://www.viso-systems.com/VT241014-004577)

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 88,5 Hz
 Percent Flicker 0,08 %
 Flicker index 0

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

JA8/10 40 Hz 0,03 %
 JA8/10 90 Hz 0,03 %
 JA8/10 200 Hz 0,06 %
 JA8/10 400 Hz 0,07 %
 JA8/10 1000 Hz 0,07 %

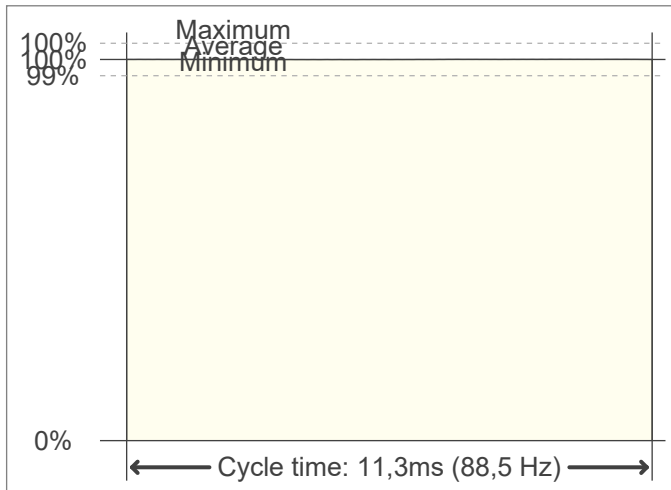
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

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

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

