

# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

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  
 $\gamma$  (gamma)-Resolution  
Test Distance  
Input Power, Power and Displ. Factors  
Input RMS Voltage and Current  
Frequency of Input Power  
Warm-up Time and Variation

12 planes – 30°  
5°  
12,10 m  
14,9 W – PF 0,94 – DPF 0,96  
230 V – 0,069 A  
50 Hz  
Lamp stabilized in 15 min 0 sec – 2,0%

## Tested Light Source

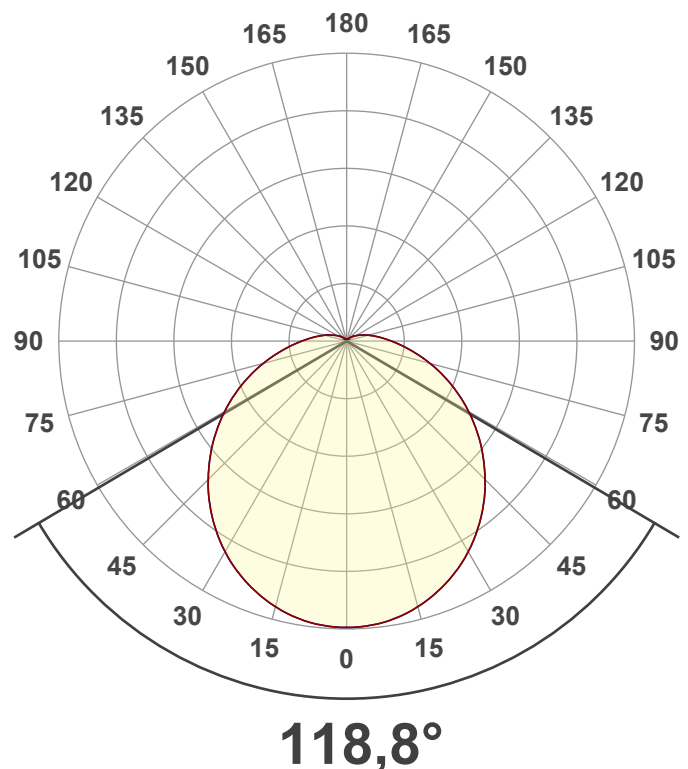
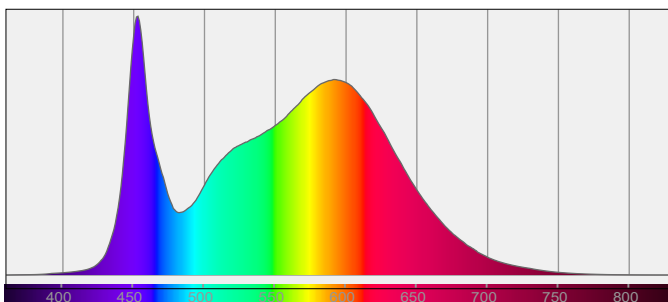
Product Name  
Item No. and Manufacturer  
Product Description (line 1)

T8H-105-4000K  
T8H-105-4000K – Dutchfulfillment  
HIGH LUMEN LED TL-BUIS | T8 | 105CM

## 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

1943 lm – 9,01% / 90,99%  
131 lm/W  
541 cd – 118,8°  
CCT = 4000 K / 4211 K  
CRI 82,3  
 $R_f$  82,2 –  $R_g$  94,1  
Duv -0,0024 – SDCM 5,0  
SVM 2,27 – PstLM 0,08



# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

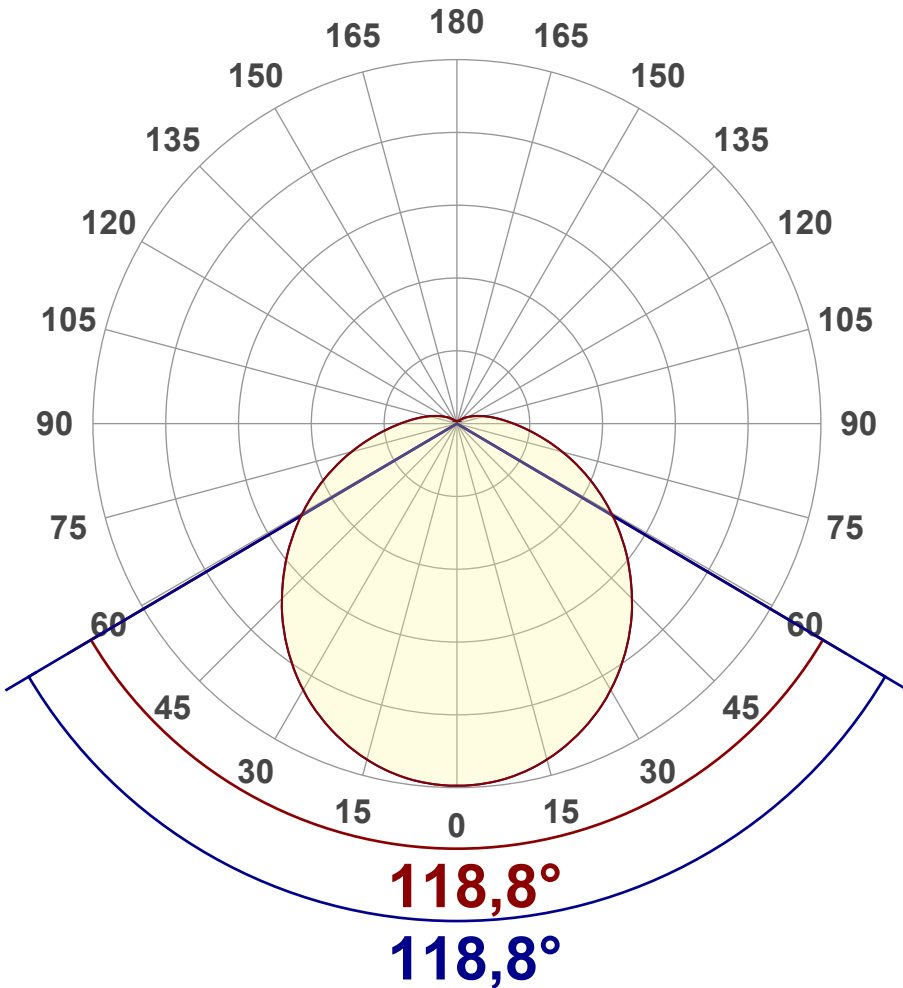
Measurement tracking No. and Link: [VT250303-008641](https://www.viso-systems.com/VT250303-008641)

Operator:



## Luminous Intensity diagram

Unit: 0-100% of peak intensity



## Main Values

|                      |                |
|----------------------|----------------|
| Output (total Lumen) | 1943 lm        |
| Lumen Up% / Down%    | 9,01% / 90,99% |
| Peak Intensity       | 541 cd         |
| Beam Angle (50%)     | 118,8°         |
| Beam Angle (90%)     | 118,8°         |
| Beam Angle (10%)     | 118,8°         |

## Cut-off Angle

|              |      |
|--------------|------|
| Average 2,5% | 257° |
|--------------|------|

## Field Angle

|             |      |
|-------------|------|
| Average 10% | 200° |
|-------------|------|

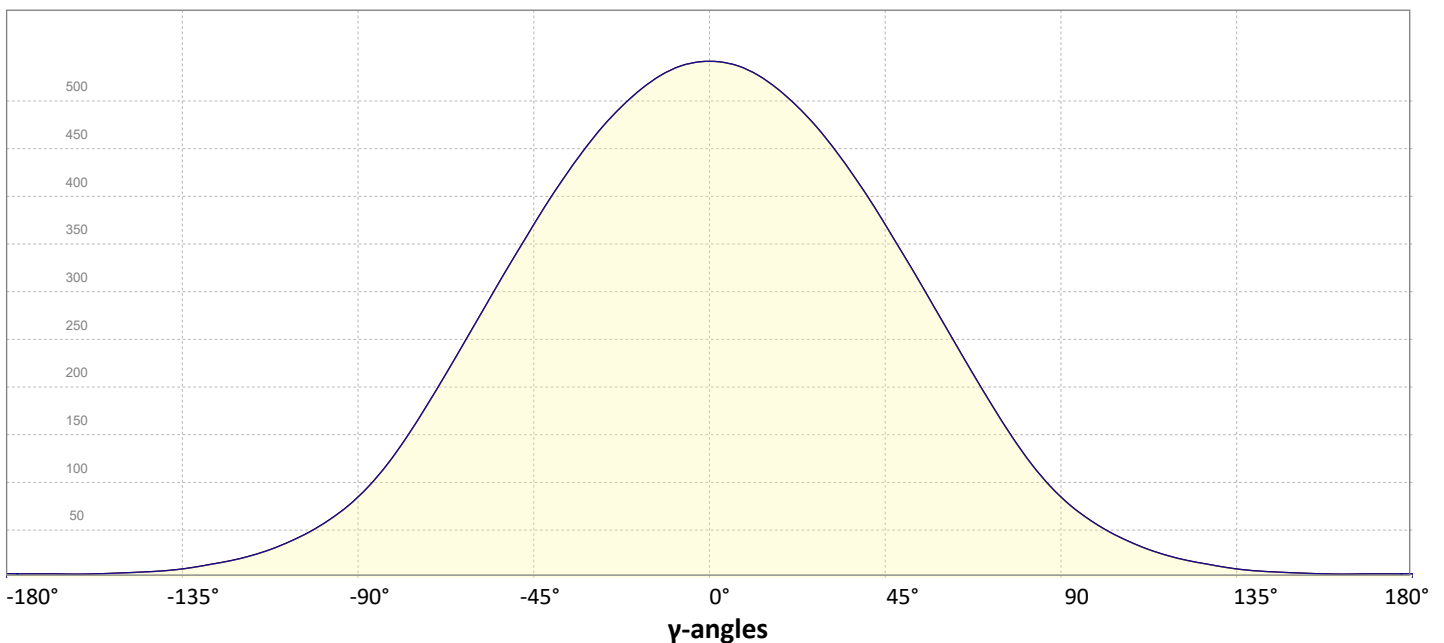
## Intensity Ratio

|              |       |
|--------------|-------|
| In 120° cone | 64,3% |
| In 90° cone  | 43,0% |

**C000-C180**

**C090-C270**

## Linear distribution diagram - Intensity (candela) vs $\gamma$ -angle



# Light Measurement Report

Print date: 3-3-2025

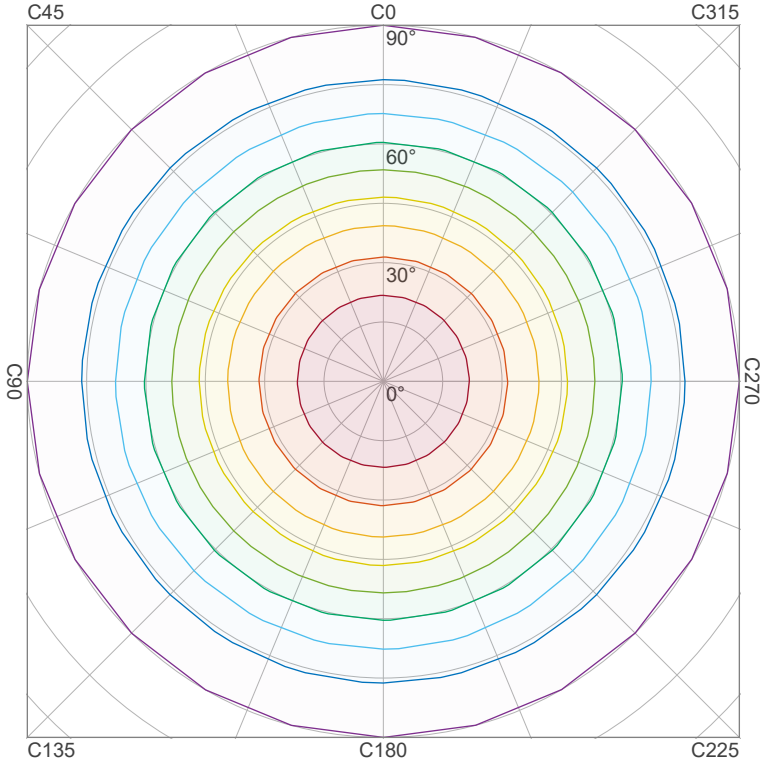
Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](https://vt250303-008641)

Operator:



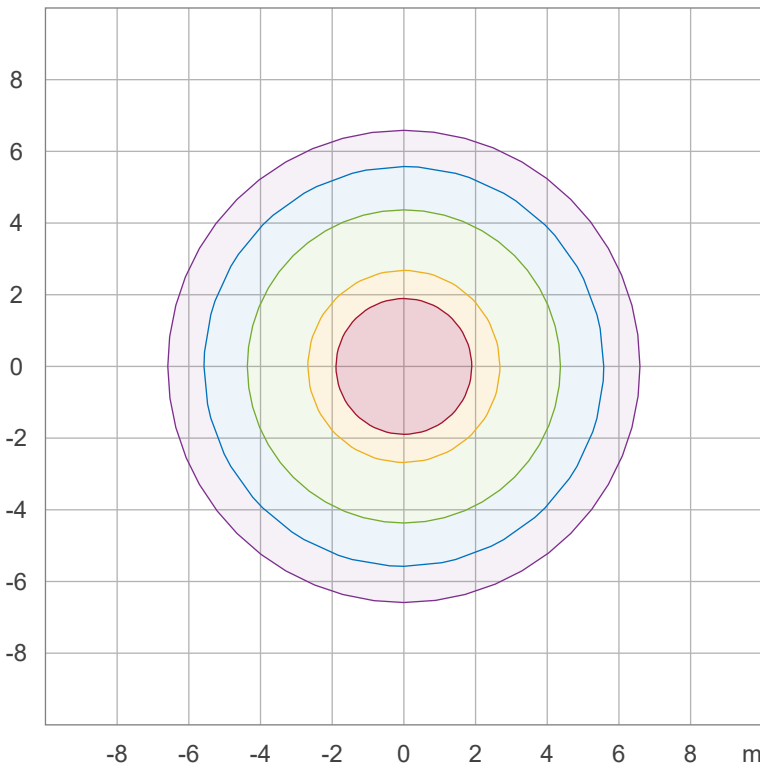
## Iso-intensity Diagram (Iso-candela)



|      |          |
|------|----------|
| 90 % | 486,9 cd |
| 80 % | 432,8 cd |
| 70 % | 378,7 cd |
| 60 % | 324,6 cd |
| 50 % | 270,5 cd |
| 40 % | 216,4 cd |
| 30 % | 162,3 cd |
| 20 % | 108,2 cd |
| 10 % | 54,1 cd  |

Peak intensity: 541,0 cd  
Number of c-planes: 12

## Iso-illuminance Diagram (Iso-lux)



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

Peak illuminance: 60,1 lx  
Mounting height: 3,0 m  
Number of c-planes: 12

# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

Operator:



## Color details

Correlated Color Temperature, Target CCT = 4000 K  
 Correlated Color Temperature, Measured CCT = 4211 K  
 Color Rendering Index CRI 82,3  
 Color Rendering Index, R9 (red component) R9 = 1,1  
 Color Rendering TM30-18 R<sub>f</sub> 82,2 – R<sub>g</sub> 94,1  
 Color Quality Scale CQS = 79,9

MacAdam Steps  
 Color coordinates CIE 1931 (x;y) = (0,381;0,377)  
 Color coordinate CIEs 1960 (u;v) = (0,225;0,334)  
 Color deviation from BBL Duv = -0,0024  
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,225;0,502)

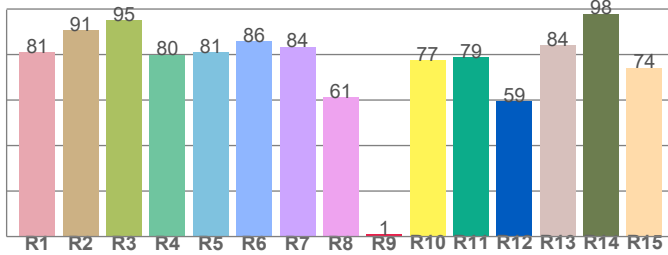
### CIE 1931



### CIE 1931 – zoomed on Planckian locus



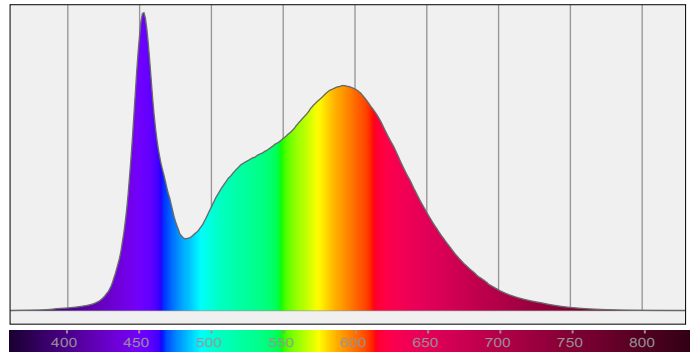
### Color Rendering Index per reference color (CIE 1995)



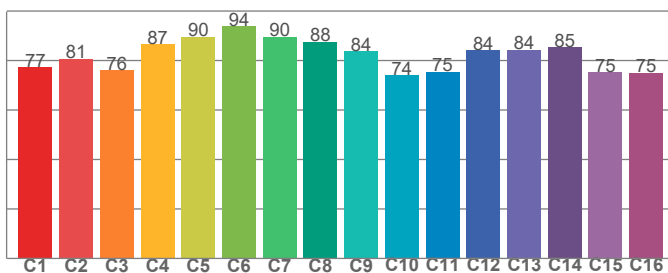
CRI R values, only R1-R8 are used to calculate final CRI value

| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   | R9  | R10  | R11  | R12  | R13  | R14  | R15  |
|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|
| 81,0 | 90,8 | 95,0 | 79,9 | 81,0 | 85,8 | 83,5 | 61,2 | 1,1 | 77,4 | 78,9 | 59,5 | 84,0 | 98,0 | 74,2 |

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



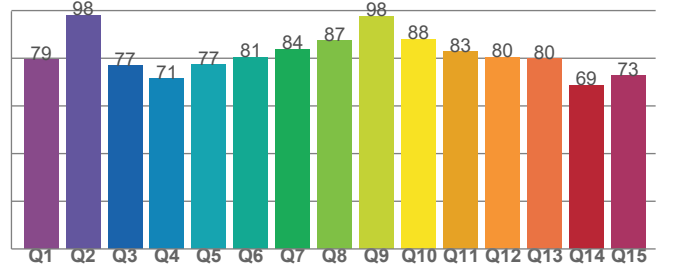
### TM30-18 R<sub>f</sub>-values per hue bin



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  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 77,3 | 80,8 | 76,1 | 86,7 | 89,6 | 93,9 | 89,7 | 87,6 | 83,7 | 74,1 | 75,5 | 84,2 | 84,3 | 85,3 | 75,2 | 75,1 |

### Color Quality Scale by reference color



CQS Q values

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 79,4 | 98,0 | 76,8 | 71,4 | 77,3 | 80,5 | 83,8 | 87,3 | 97,6 | 88,0 | 82,8 | 80,4 | 79,8 | 68,7 | 72,7 |

# Light Measurement Report

Print date: 3-3-2025

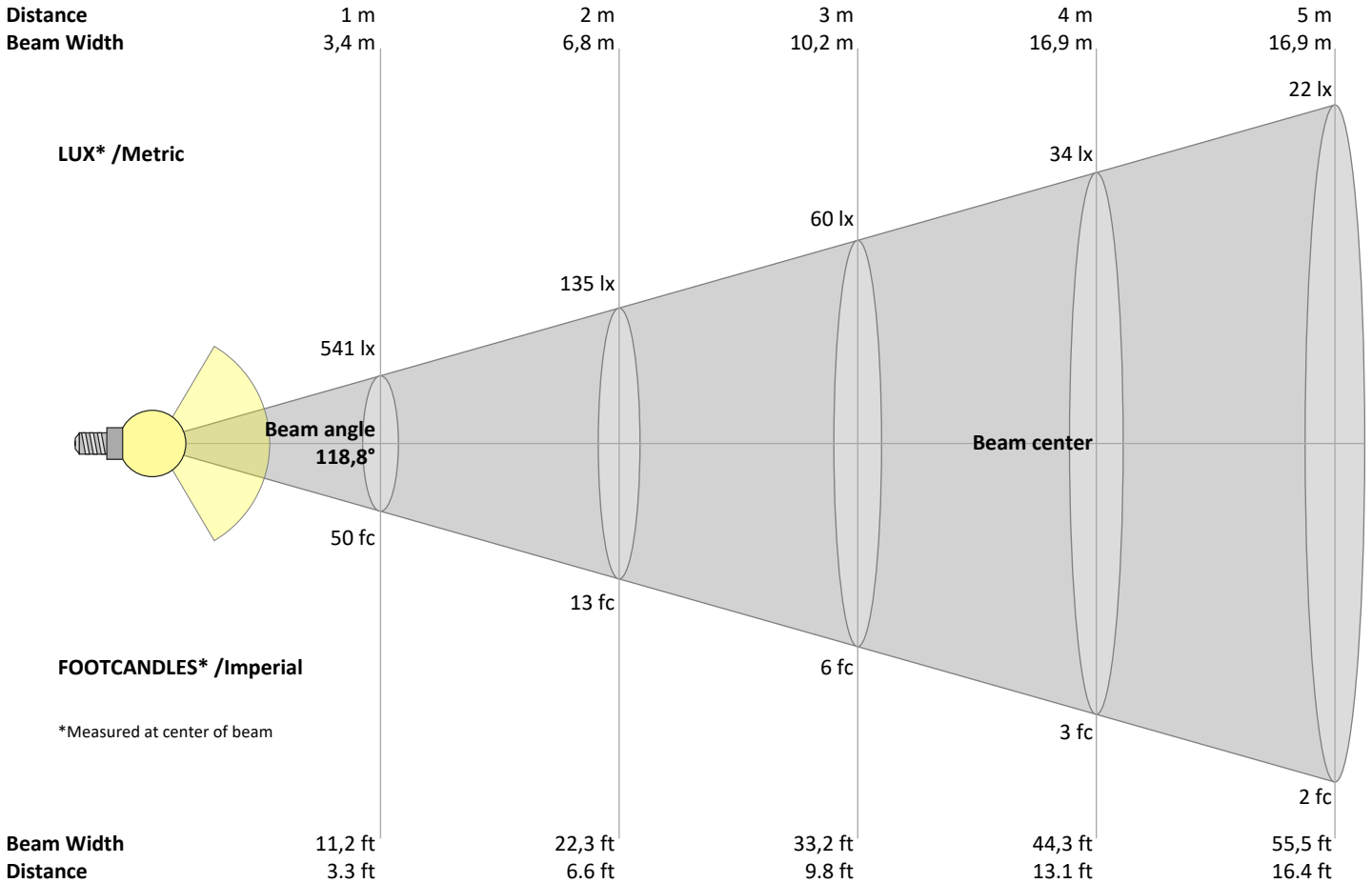
Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](https://www.viso-systems.com/VT250303-008641)

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  |
| 541  | 135  | 60  | 34   | 22   | 15   | 11 | 8    | 7    | 5    | 4    | 4    | 3    | 3    | 2    | 2    | 2    | 2    | 1    | 1    | lux |
| 50,3 | 12,6 | 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°   | 9°  | 18° | 27° | 36° | 45° | 54° | 63° | 72° | 81° | 90° | 99° | 108° | 117° | 126° | 135° | 144° | 153° | 162° | 171° | γ        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|----------|
| 541  | 534 | 511 | 475 | 427 | 370 | 309 | 245 | 183 | 128 | 85  | 57  | 37   | 24   | 15   | 9    | 6    | 5    | 4    | 4    | cd       |
| 100% | 99% | 94% | 88% | 79% | 68% | 57% | 45% | 34% | 24% | 16% | 10% | 7%   | 4%   | 3%   | 2%   | 1%   | 1%   | 1%   | 1%   | of 0°val |

### Intensities in 90° c-plane

| 0°   | 9°  | 18° | 27° | 36° | 45° | 54° | 63° | 72° | 81° | 90° | 99° | 108° | 117° | 126° | 135° | 144° | 153° | 162° | 171° | γ        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|----------|
| 541  | 534 | 511 | 475 | 427 | 370 | 309 | 245 | 183 | 128 | 85  | 57  | 37   | 24   | 15   | 9    | 6    | 5    | 4    | 4    | cd       |
| 100% | 99% | 94% | 88% | 79% | 68% | 57% | 45% | 34% | 24% | 16% | 10% | 7%   | 4%   | 3%   | 2%   | 1%   | 1%   | 1%   | 1%   | of 0°val |

### Intensities in 180° c-plane

| 0°   | 9°  | 18° | 27° | 36° | 45° | 54° | 63° | 72° | 81° | 90° | 99° | 108° | 117° | 126° | 135° | 144° | 153° | 162° | 171° | γ        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|----------|
| 541  | 534 | 511 | 475 | 427 | 370 | 309 | 245 | 183 | 128 | 85  | 57  | 37   | 24   | 15   | 9    | 6    | 5    | 4    | 4    | cd       |
| 100% | 99% | 94% | 88% | 79% | 68% | 57% | 45% | 34% | 24% | 16% | 10% | 7%   | 4%   | 3%   | 2%   | 1%   | 1%   | 1%   | 1%   | of 0°val |

### Intensities in 270° c-plane

| 0°   | 9°  | 18° | 27° | 36° | 45° | 54° | 63° | 72° | 81° | 90° | 99° | 108° | 117° | 126° | 135° | 144° | 153° | 162° | 171° | γ        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|----------|
| 541  | 534 | 511 | 475 | 427 | 370 | 309 | 245 | 183 | 128 | 85  | 57  | 37   | 24   | 15   | 9    | 6    | 5    | 4    | 4    | cd       |
| 100% | 99% | 94% | 88% | 79% | 68% | 57% | 45% | 34% | 24% | 16% | 10% | 7%   | 4%   | 3%   | 2%   | 1%   | 1%   | 1%   | 1%   | of 0°val |

# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

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        | 21,9   | 23,1 | 22,3 | 23,5 | 23,9 | 21,0   | 22,2 | 21,4 | 22,6 | 23,0 |
|                                     | 3H        | 23,8   | 25,0 | 24,3 | 25,5 | 25,8 | 22,5   | 23,8 | 23,1 | 24,2 | 24,6 |
|                                     | 4H        | 24,8   | 26,0 | 25,3 | 26,4 | 26,9 | 23,3   | 24,5 | 23,8 | 24,9 | 25,4 |
|                                     | 6H        | 25,9   | 26,9 | 26,3 | 27,4 | 27,9 | 24,0   | 25,1 | 24,5 | 25,5 | 26,1 |
|                                     | 8H        | 26,4   | 27,5 | 26,9 | 27,9 | 28,5 | 24,4   | 25,4 | 24,8 | 25,8 | 26,4 |
|                                     | 12H       | 27,0   | 28,1 | 27,5 | 28,5 | 29,1 | 24,6   | 25,7 | 25,1 | 26,1 | 26,7 |
| 4H                                  | 2H        | 22,4   | 23,5 | 22,9 | 24,0 | 24,4 | 21,7   | 22,8 | 22,2 | 23,3 | 23,7 |
|                                     | 3H        | 24,6   | 25,6 | 25,1 | 26,0 | 26,7 | 23,5   | 24,6 | 24,0 | 25,0 | 25,6 |
|                                     | 4H        | 25,6   | 26,7 | 26,2 | 27,1 | 27,8 | 24,4   | 25,4 | 24,9 | 25,8 | 26,5 |
|                                     | 6H        | 26,8   | 27,7 | 27,4 | 28,2 | 28,8 | 25,2   | 26,1 | 25,8 | 26,6 | 27,1 |
|                                     | 8H        | 27,5   | 28,3 | 28,1 | 28,8 | 29,3 | 25,6   | 26,4 | 26,2 | 26,9 | 27,5 |
|                                     | 12H       | 28,2   | 28,8 | 28,8 | 29,4 | 30,0 | 25,9   | 26,6 | 26,6 | 27,2 | 27,8 |
| 8H                                  | 4H        | 25,9   | 26,7 | 26,5 | 27,2 | 27,8 | 24,8   | 25,6 | 25,4 | 26,1 | 26,7 |
|                                     | 6H        | 27,3   | 27,9 | 27,9 | 28,5 | 29,2 | 25,9   | 26,5 | 26,5 | 27,1 | 27,8 |
|                                     | 8H        | 28,1   | 28,6 | 28,7 | 29,3 | 30,0 | 26,4   | 26,9 | 27,0 | 27,6 | 28,4 |
|                                     | 12H       | 28,9   | 29,4 | 29,6 | 30,0 | 30,8 | 26,9   | 27,4 | 27,6 | 28,0 | 28,7 |
| 12H                                 | 4H        | 25,9   | 26,6 | 26,5 | 27,2 | 27,8 | 24,9   | 25,6 | 25,5 | 26,1 | 26,8 |
|                                     | 6H        | 27,4   | 27,9 | 28,0 | 28,6 | 29,4 | 26,0   | 26,6 | 26,7 | 27,2 | 28,0 |
|                                     | 8H        | 28,2   | 28,7 | 28,9 | 29,3 | 30,1 | 26,6   | 27,1 | 27,3 | 27,7 | 28,5 |

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

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

## 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                   | 117   | 117 | 117 | 117 | 113 | 113 | 113 | 113 | 106 | 106 | 106 | 100 | 100 | 100 | 94 | 94 | 94 | 91 |
| 1                   | 105   | 99  | 94  | 89  | 101 | 96  | 91  | 87  | 90  | 86  | 83  | 84  | 81  | 78  | 79 | 77 | 74 | 72 |
| 2                   | 94  | 85  | 78  | 71  | 91  | 82  | 75  | 70  | 77  | 72  | 67  | 73  | 68  | 64  | 68 | 64 | 61 | 58 |
| 3                   | 86  | 74  | 65  | 58  | 82  | 72  | 64  | 57  | 68  | 61  | 55  | 64  | 58  | 53  | 60 | 55 | 51 | 48 |
| 4                   | 78  | 65  | 56  | 49  | 75  | 63  | 55  | 48  | 60  | 52  | 46  | 56  | 50  | 45  | 53 | 48 | 43 | 41 |
| 5                   | 72  | 58  | 49  | 42  | 69  | 57  | 48  | 41  | 53  | 46  | 40  | 50  | 44  | 39  | 48 | 42 | 37 | 35 |
| 6                   | 66  | 52  | 43  | 36  | 64  | 51  | 42  | 36  | 48  | 40  | 35  | 46  | 39  | 34  | 43 | 37 | 33 | 30 |
| 7                   | 61  | 47  | 38  | 32  | 59  | 46  | 38  | 31  | 44  | 36  | 31  | 41  | 35  | 30  | 39 | 33 | 29 | 27 |
| 8                   | 57  | 43  | 34  | 28  | 55  | 42  | 34  | 28  | 40  | 33  | 27  | 38  | 31  | 27  | 36 | 30 | 26 | 24 |
| 9                   | 53  | 39  | 31  | 25  | 51  | 38  | 31  | 25  | 37  | 30  | 24  | 35  | 29  | 24  | 33 | 28 | 23 | 21 |
| 10                  | 50  | 36  | 28  | 23  | 48  | 35  | 28  | 23  | 34  | 27  | 22  | 32  | 26  | 22  | 31 | 25 | 21 | 19 |

# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

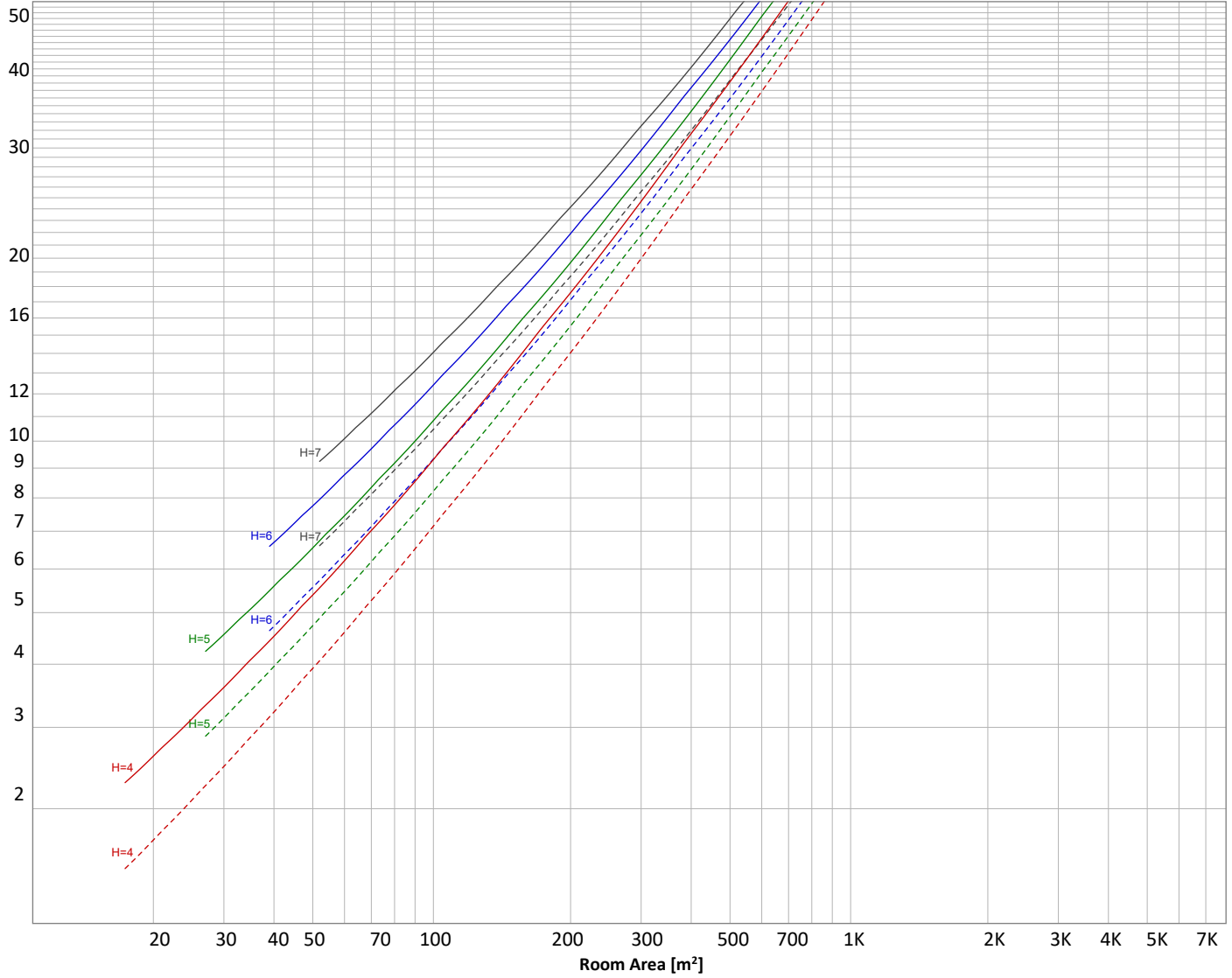
Operator:



## Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



### Conditions

|   |                |           |                     |                          |                   |
|---|----------------|-----------|---------------------|--------------------------|-------------------|
| H = Room height                                   | Flux = 1943 lm |           |                     |                          |                   |
| H <sub>down</sub> = Lamp distance from ceiling =  | 0.00 m         | Line type | Ceiling reflectance | ρ(%)<br>Wall reflectance | Floor reflectance |
| H <sub>work</sub> = Work area height from floor = | 0.00 m         | -----     | 70                  | 50                       | 30                |
| E <sub>work</sub> = 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°   |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 51,3 lm  | 147 lm    | 223 lm    | 271 lm    | 286 lm    | 270 lm    | 229 lm    | 173 lm    | 117 lm    |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 74,2 lm  | 45,5 lm   | 26,2 lm   | 14,5 lm   | 7,32 lm   | 3,82 lm   | 2,05 lm   | 1,10 lm   | 0,389 lm  |

# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

Operator:



## Outdoor Light Planning

### Lumen per Zone

| Zone (γ)     | Lumen          | % Total       |
|--------------|----------------|---------------|
| 0-10°        | 51 lm          | 2,6%          |
| 10-20°       | 147 lm         | 7,6%          |
| 20-30°       | 223 lm         | 11,5%         |
| 30-40°       | 271 lm         | 14,0%         |
| 40-50°       | 286 lm         | 14,7%         |
| 50-60°       | 270 lm         | 13,9%         |
| 60-70°       | 229 lm         | 11,8%         |
| 70-80°       | 173 lm         | 8,9%          |
| 80-90°       | 117 lm         | 6,0%          |
| 90-100°      | 74 lm          | 3,8%          |
| 100-110°     | 45 lm          | 2,3%          |
| 110-120°     | 26 lm          | 1,3%          |
| 120-130°     | 15 lm          | 0,7%          |
| 130-140°     | 7 lm           | 0,4%          |
| 140-150°     | 4 lm           | 0,2%          |
| 150-160°     | 2 lm           | 0,1%          |
| 160-170°     | 1 lm           | 0,1%          |
| 170-180°     | 0 lm           | 0,0%          |
| <b>Total</b> | <b>1943 lm</b> | <b>100,0%</b> |

### Intensity peaks

|                |        |
|----------------|--------|
| Max intensity  | 541 cd |
| Intensity, 90° | 85 cd  |
| Intensity, 0°  | 541 cd |

### Zonal Lumen summary

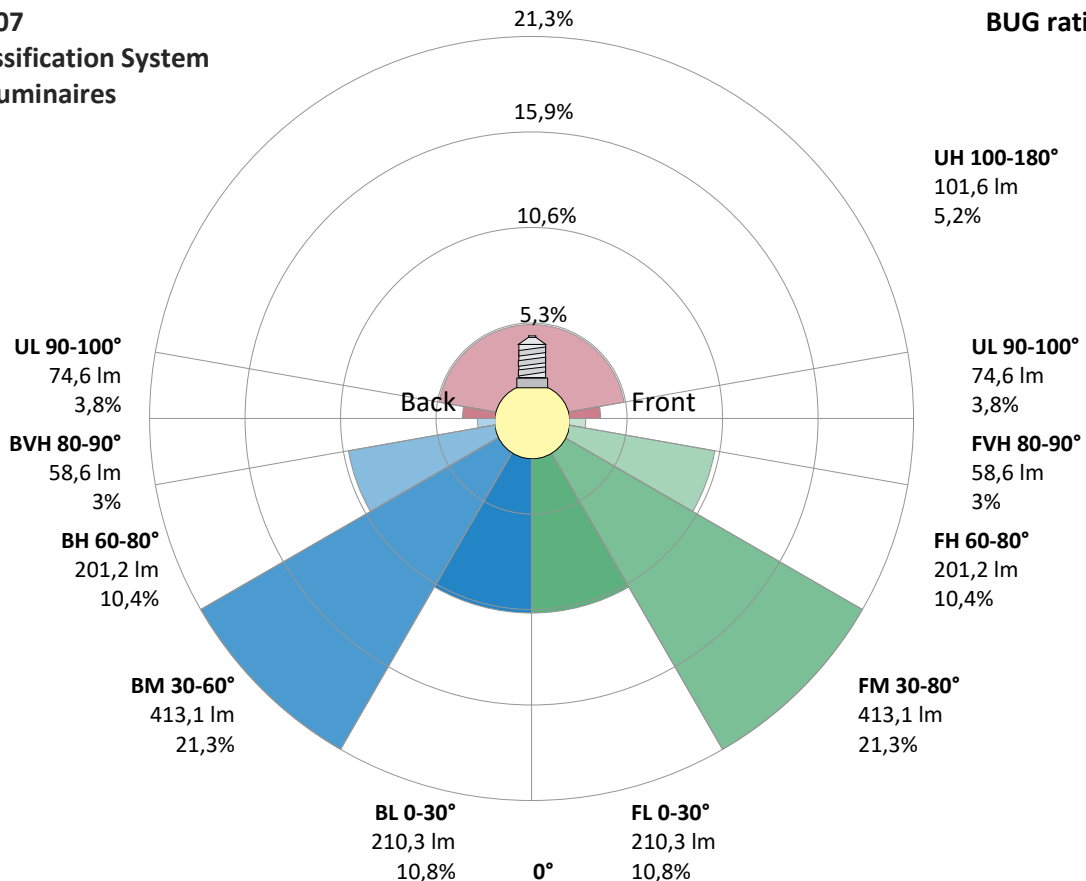
| Zone (γ) | Lumen   | % Total |
|----------|---------|---------|
| 0-30°    | 421 lm  | 21,7%   |
| 0-40°    | 692 lm  | 35,6%   |
| 0-60°    | 1249 lm | 64,3%   |
| 60-90°   | 519 lm  | 26,7%   |
| 70-100°  | 364 lm  | 18,7%   |
| 90-120°  | 146 lm  | 7,5%    |
| 0-90°    | 1768 lm | 91,0%   |
| 90-180°  | 175 lm  | 9,0%    |
| 0-180°   | 1943 lm | 100,0%  |

### BUG rating

|                      | Lumen  | % Total |
|----------------------|--------|---------|
| <b>Forward light</b> |        |         |
| Low(0-30°)           | 210 lm | 10,8%   |
| Medium(30-60°)       | 413 lm | 21,3%   |
| High(60-80°)         | 201 lm | 10,4%   |
| Very high(80-90°)    | 59 lm  | 3,0%    |
| <b>Back light</b>    |        |         |
| Low(0-30°)           | 210 lm | 10,8%   |
| Medium(30-60°)       | 413 lm | 21,3%   |
| High(60-80°)         | 201 lm | 10,4%   |
| Very high(80-90°)    | 59 lm  | 3,0%    |
| <b>Uplight</b>       |        |         |
| Low(90-100°)         | 75 lm  | 3,8%    |
| High(100-180°)       | 102 lm | 5,2%    |

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

**BUG rating B1 U3 G1**



# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

Operator:

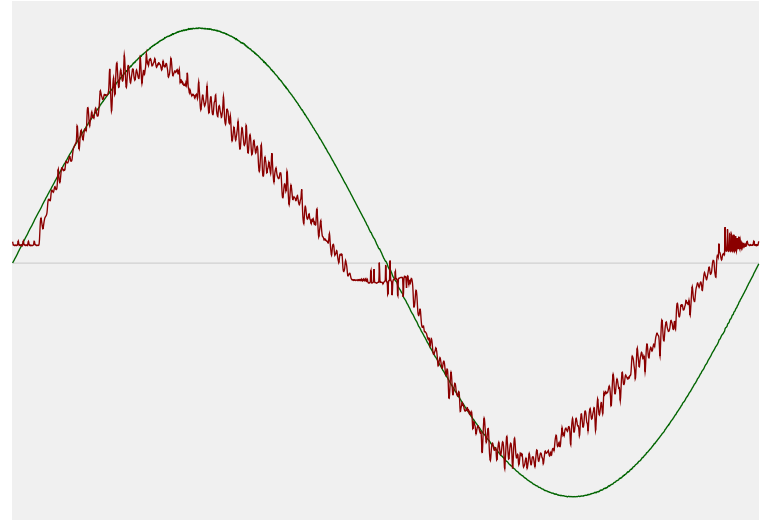


## Power Details

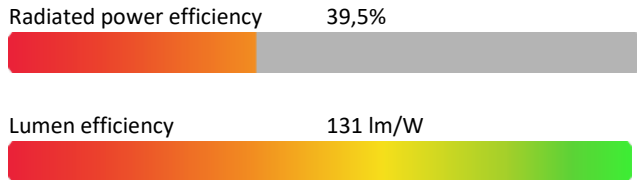
### Input Power

|   |          |
|---|----------|
| Power feed to light source                          | 14,9 W   |
| Frequency of input power                            | 50 Hz    |
| RMS Input voltage feed, $V_{RMS}$                   | 230 V    |
| RMS Input current feed, $I_{RMS}$                   | 0,069 A  |
| Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$ | 15,84 VA |
| Displacement factor of AC power feed                | 0,96     |
| Power factor of AC current feed                     | 0,94     |
| Total harmonic distortion of the current            | 17,81%   |
| 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 | 3993 K |
| CCT shift | +7 K   |
| CCT end   | 4000 K |

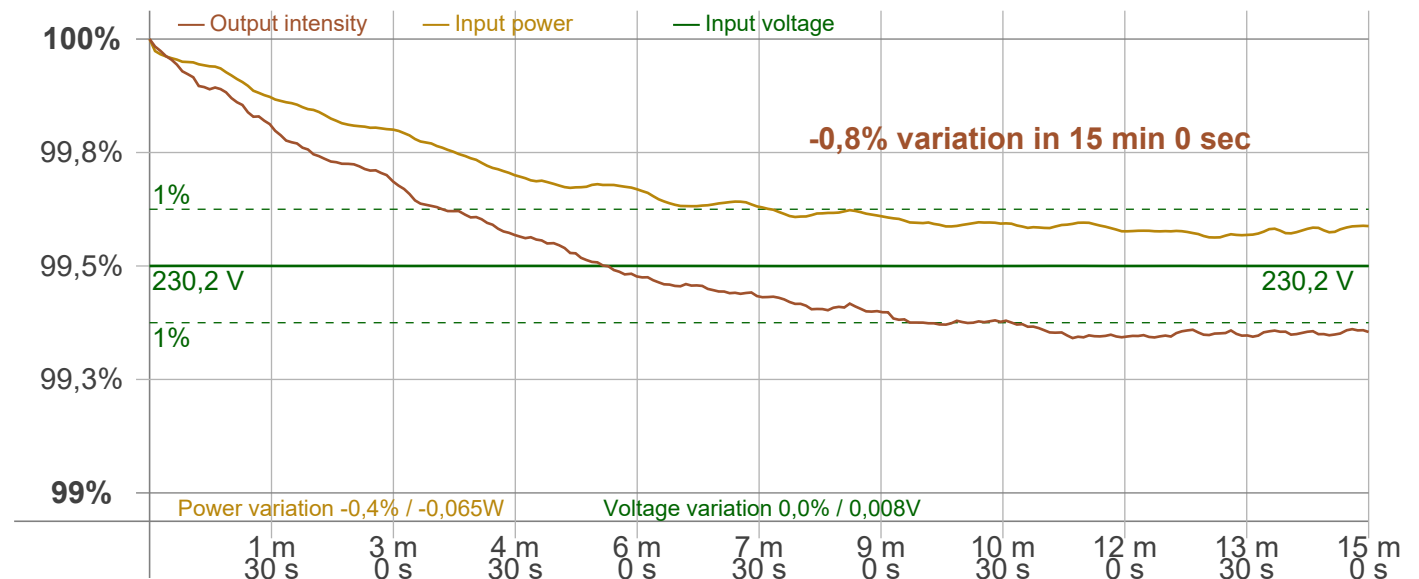
### Warmup Result

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

### Output Change

|               |         |
|---------------|---------|
| Output start  | 1956 lm |
| Output change | -13 lm  |
| Output end    | 1943 lm |

### Stabilization Curve



# Light Measurement Report

Print date: 3-3-2025

Measurement date and time: 3-3-2025 11:33:53 – Measurement no. VFR-250303-0287-MS

Measurement tracking No. and Link: [VT250303-008641](#)

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: 59,2 %  
 Flicker index: 0,19

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

JA8/10 40 Hz: 0,14 %  
 JA8/10 90 Hz: 0,51 %  
 JA8/10 200 Hz: 58,96 %  
 JA8/10 400 Hz: 59,27 %  
 JA8/10 1000 Hz: 59,3 %

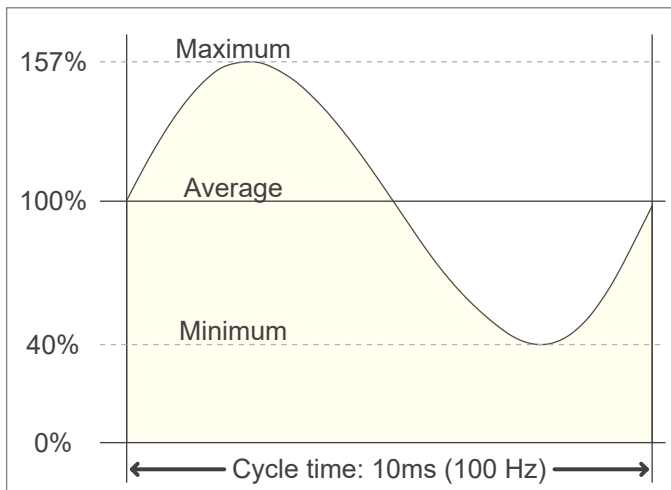
### TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz): 0,08  
 SVM value (80 < F < 2000 Hz): 2,27

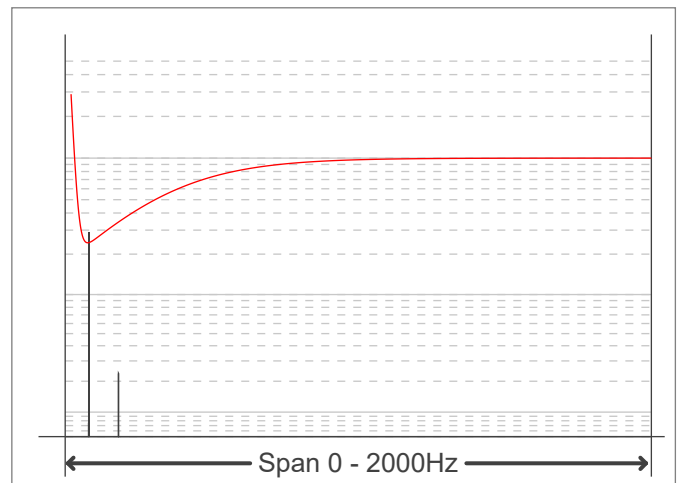
### Flicker indices according to Lighting Research Center (2015)

Perception metric, Assist Mp: 0,05

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



Flicker FFT (flicker curve in frequency domain)



IEEE 1789 Frequency/modulation plot

