

# Light Measurement Report

Print date: 15-8-2025

Measurement date and time: 15-8-2025 09:23:50 – Measurement no. VFR-250815-2563-MS

Measurement tracking No. and Link: [VT250815-000098](#)

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

28 planes – 12,86°  
5°  
3,99 m  
20,1 W – PF 0,97 – DPF 0,97  
230 V – 0,090 A  
50 Hz  
Lamp stabilized in 15 min 3 sec – 2,0%

## Tested Light Source

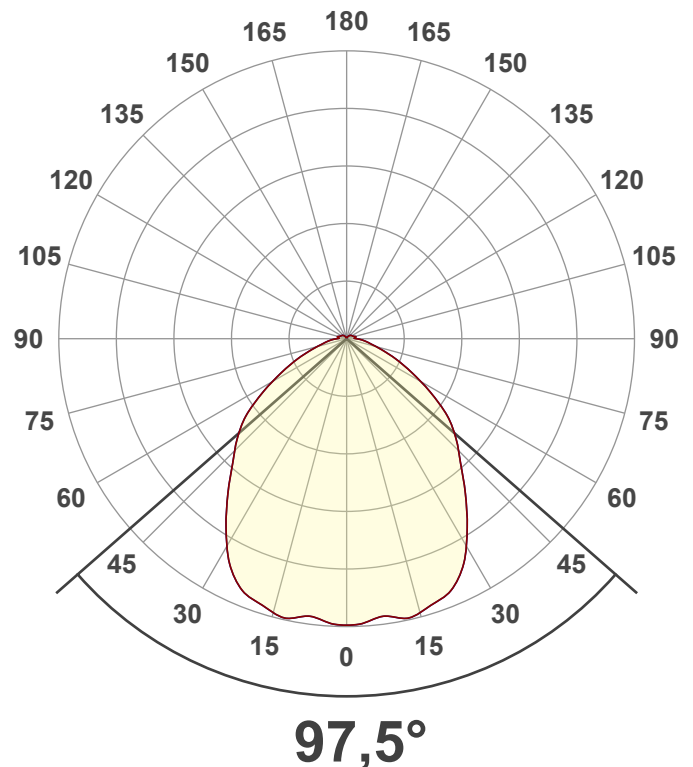
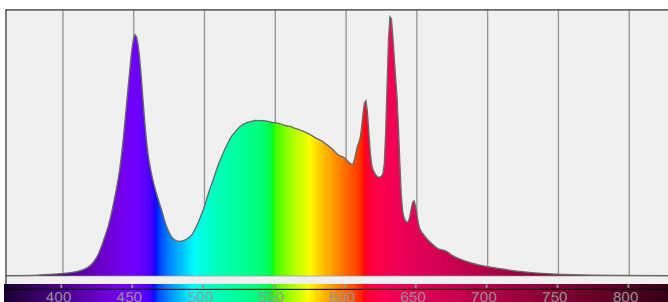
Product Name  
Item No. and Manufacturer  
Product Description (line 1)  
ZWART | CCT SWITCH

812959-5000K-20W  
812959-5000K-20W – Dutchfulfillment  
3-FASE RAILARMATUUR | TARVOS | 60CM | 12W/16W/20W/24W |

## 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

2551 lm – 4,95% / 95,05%  
127 lm/W  
997 cd – 97,5°  
CCT = 5000 K / 4895 K  
CRI 82,7  
 $R_f$  83,0 –  $R_g$  99,3  
Duv 0,0073 – SDCM 7,4  
SVM 0 – PstLM 0,01



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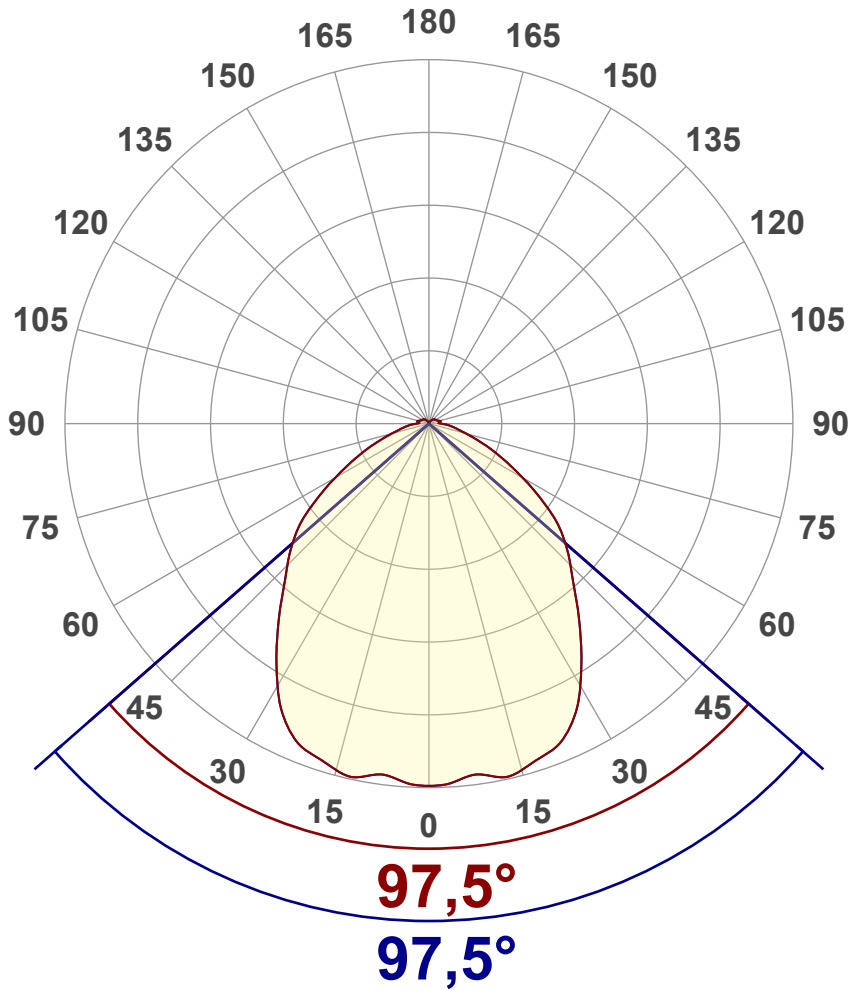
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## Luminous Intensity diagram

Unit: 0-100% of peak intensity



### Main Values

|                      |                |
|----------------------|----------------|
| Output (total Lumen) | 2551 lm        |
| Lumen Up% / Down%    | 4,95% / 95,05% |
| Peak Intensity       | 997 cd         |
| Beam Angle (50%)     | 97,5°          |
| Beam Angle (90%)     | 97,5°          |
| Beam Angle (10%)     | 97,5°          |

### Cut-off Angle

|              |        |
|--------------|--------|
| Average 2,5% | 220,8° |
|--------------|--------|

### Field Angle

|             |        |
|-------------|--------|
| Average 10% | 152,1° |
|-------------|--------|

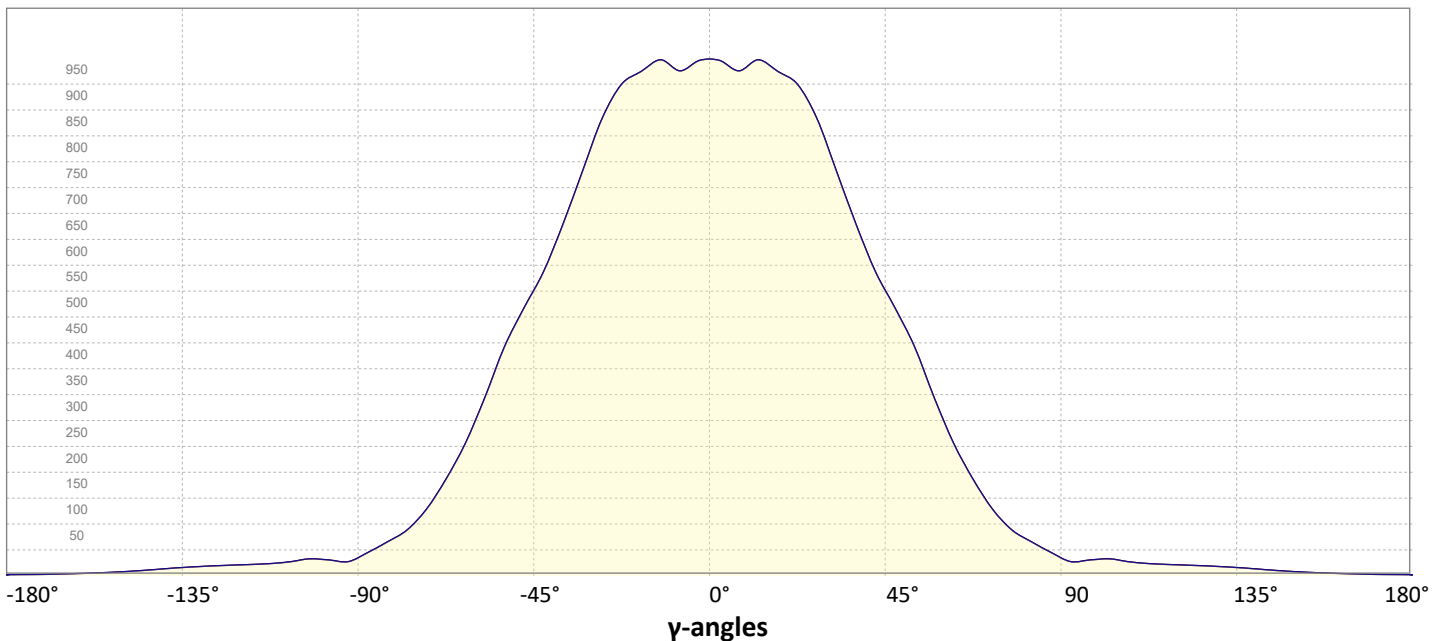
### Intensity Ratio

|              |       |
|--------------|-------|
| In 120° cone | 79,6% |
| In 90° cone  | 57,6% |

**C000-C180**

**C090-C270**

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



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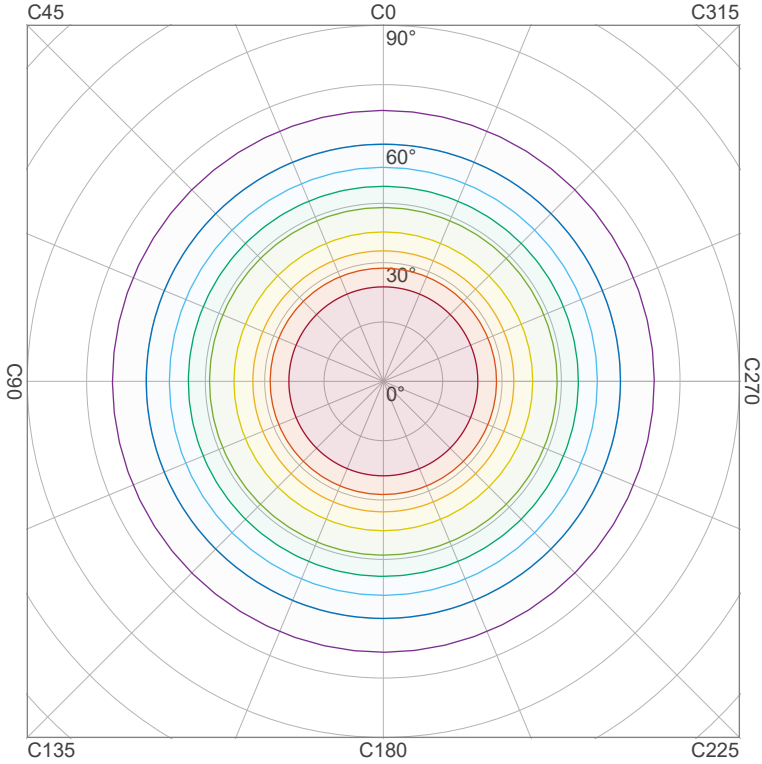
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## Iso-intensity Diagram (Iso-candela)

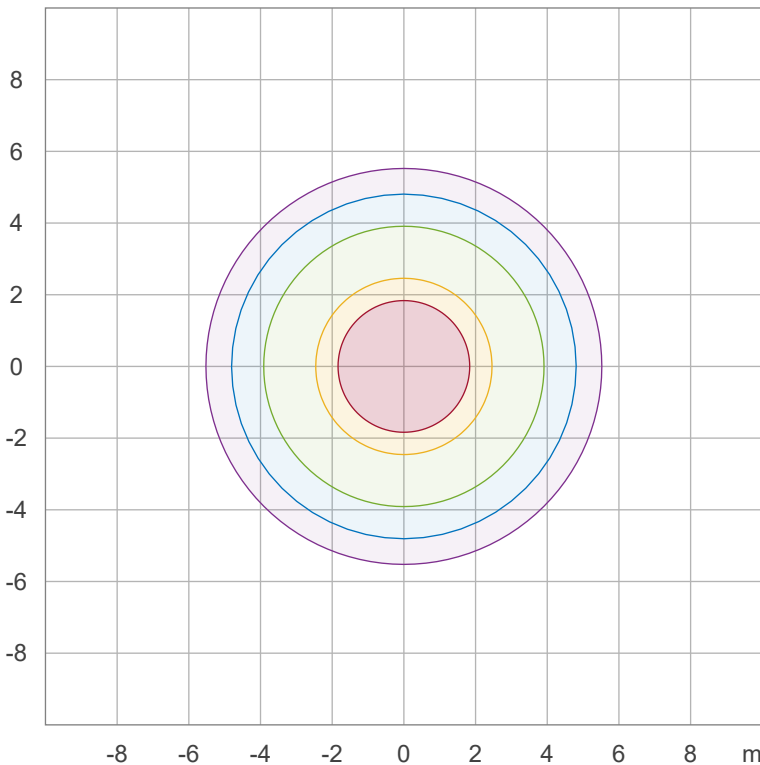


|      |          |
|------|----------|
| 90 % | 896,3 cd |
| 80 % | 796,7 cd |
| 70 % | 697,1 cd |
| 60 % | 597,5 cd |
| 50 % | 497,9 cd |
| 40 % | 398,3 cd |
| 30 % | 298,8 cd |
| 20 % | 199,2 cd |
| 10 % | 99,6 cd  |

Peak intensity: 995,8 cd

Number of c-planes: 28

## Iso-illuminance Diagram (Iso-lux)



|        |         |
|--------|---------|
| 50,0 % | 55,3 lx |
| 30,0 % | 33,2 lx |
| 10,0 % | 11,1 lx |
| 5,0 %  | 5,5 lx  |
| 3,0 %  | 3,3 lx  |

Peak illuminance: 110,6 lx

Mounting height: 3,0 m

Number of c-planes: 28

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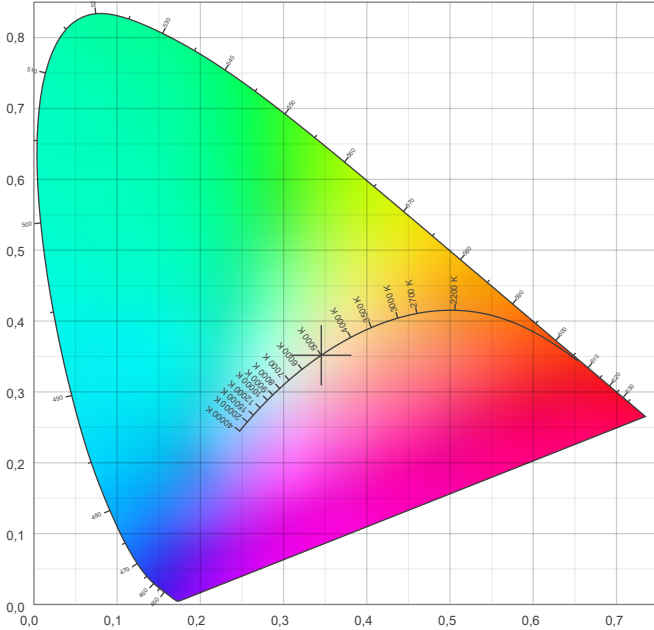


## Color details

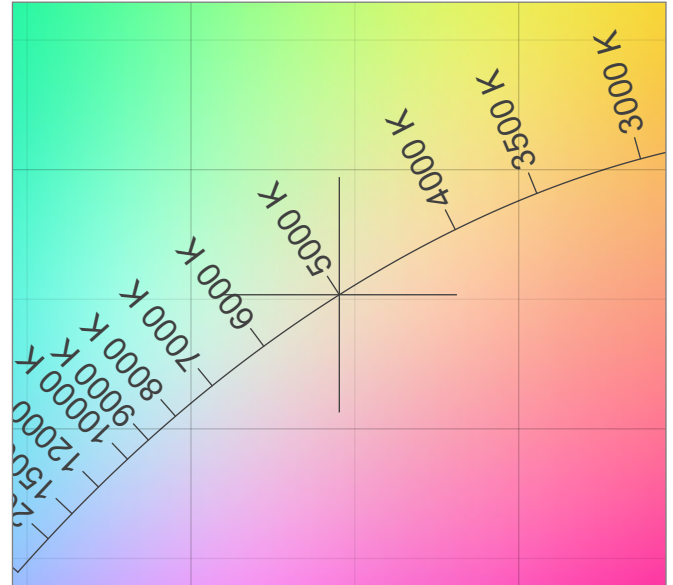
Correlated Color Temperature, Target CCT = 5000 K  
 Correlated Color Temperature, Measured CCT = 4895 K  
 Color Rendering Index CRI 82,7  
 Color Rendering Index, R9 (red component) R9 = 37,4  
 Color Rendering TM30-18 R<sub>f</sub> 83,0 – R<sub>g</sub> 99,3  
 Color Quality Scale CQS = 83,9

MacAdam Steps SDCM = 7,4  
 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 = 0,0073  
 Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,211;0,485)

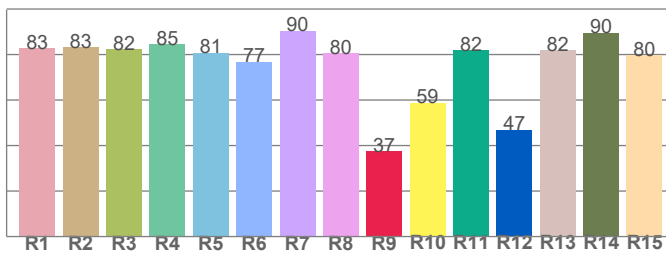
### CIE 1931



### CIE 1931 – zoomed on Planckian locus



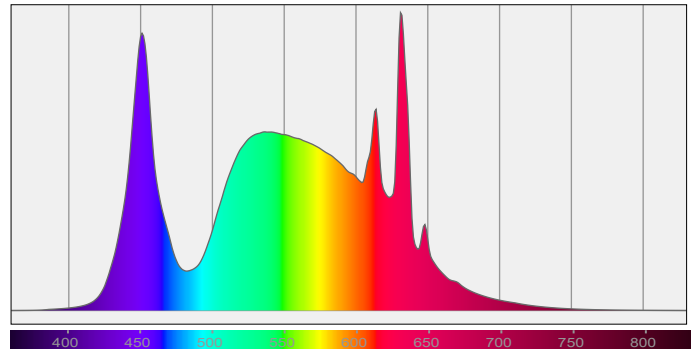
### Color Rendering Index per reference color (CIE 1995)



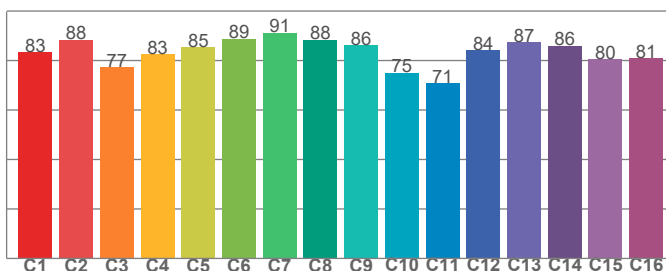
CRI R values, only R1-R8 are used to calculate final CRI value

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   | R9   | R10  | R11  | R12  | R13  | R14  | R15  |
| 82,7 | 83,3 | 82,2 | 84,5 | 80,7 | 76,9 | 90,4 | 80,5 | 37,4 | 58,8 | 81,9 | 46,9 | 81,8 | 89,6 | 79,7 |

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



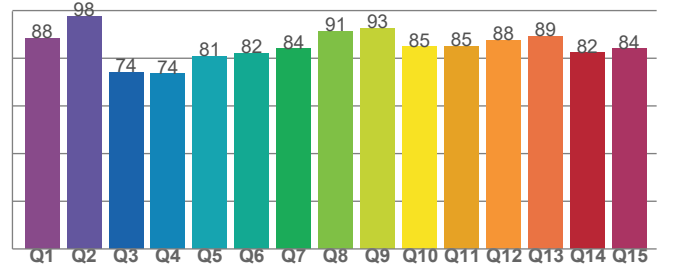
### TM30-18 R<sub>f</sub>-values per hue bin



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  |
| 83,4 | 88,4 | 77,3 | 82,6 | 85,4 | 88,7 | 91,2 | 88,4 | 86,1 | 75,1 | 70,7 | 84,3 | 87,3 | 86,0 | 80,5 | 80,9 |

### Color Quality Scale by reference color



CQS Q values

|      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |
| 88,5 | 97,7 | 74,2 | 73,5 | 81,0 | 82,1 | 84,0 | 91,4 | 92,6 | 84,8 | 85,1 | 87,6 | 89,1 | 82,3 | 84,0 |

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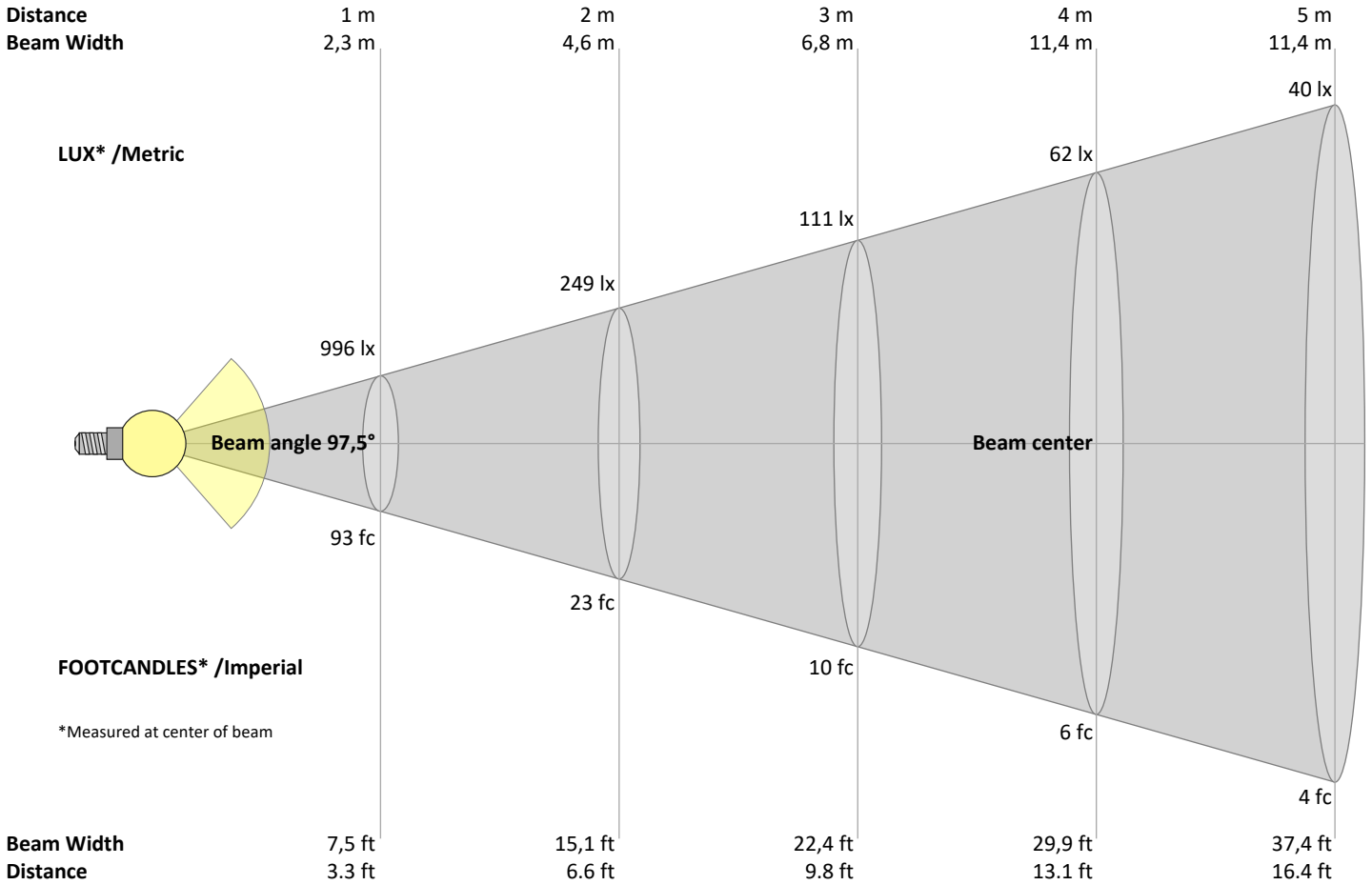
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## Beam Details



### 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  |
| 996  | 249  | 111  | 62   | 40   | 28   | 20  | 16   | 12   | 10   | 8    | 7    | 6    | 5    | 4    | 4    | 3    | 3    | 3    | 2    | lux |
| 92,5 | 23,1 | 10,3 | 5,8  | 3,7  | 2,6  | 1,9 | 1,4  | 1,1  | 0,9  | 0,8  | 0,6  | 0,5  | 0,5  | 0,4  | 0,4  | 0,3  | 0,3  | 0,3  | 0,2  | 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        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 996  | 986 | 986 | 986 | 962 | 917 | 833 | 731 | 634 | 552 | 480 | 394 | 301 | 221 | 157 | 108 | 77  | 55  | 36  | 29  | cd       |
| 100% | 99% | 99% | 99% | 97% | 92% | 84% | 73% | 64% | 55% | 48% | 40% | 30% | 22% | 16% | 11% | 8%  | 6%  | 4%  | 3%  | 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        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 996  | 986 | 986 | 986 | 962 | 917 | 833 | 731 | 634 | 552 | 480 | 394 | 301 | 221 | 157 | 108 | 77  | 55  | 36  | 29  | cd       |
| 100% | 99% | 99% | 99% | 97% | 92% | 84% | 73% | 64% | 55% | 48% | 40% | 30% | 22% | 16% | 11% | 8%  | 6%  | 4%  | 3%  | 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        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 996  | 986 | 986 | 986 | 962 | 917 | 833 | 731 | 634 | 552 | 480 | 394 | 301 | 221 | 157 | 108 | 77  | 55  | 36  | 29  | cd       |
| 100% | 99% | 99% | 99% | 97% | 92% | 84% | 73% | 64% | 55% | 48% | 40% | 30% | 22% | 16% | 11% | 8%  | 6%  | 4%  | 3%  | 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        |
|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 996  | 986 | 986 | 986 | 962 | 917 | 833 | 731 | 634 | 552 | 480 | 394 | 301 | 221 | 157 | 108 | 77  | 55  | 36  | 29  | cd       |
| 100% | 99% | 99% | 99% | 97% | 92% | 84% | 73% | 64% | 55% | 48% | 40% | 30% | 22% | 16% | 11% | 8%  | 6%  | 4%  | 3%  | of 0°val |

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

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

|          |            |            |
|----------|------------|------------|
| S = 1.0H | 0,1 / -0,2 | 0,1 / -0,1 |
| S = 1.5H | 0,3 / -0,5 | 0,2 / -0,4 |
| S = 2.0H | 0,8 / -0,9 | 0,7 / -0,8 |

## 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                   | 118  | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 108 | 108 | 108 | 103 | 103 | 103 | 97 | 97 | 97 | 95 |
| 1                   | 108  | 104 | 100 | 96  | 105 | 101 | 97  | 94  | 96  | 93  | 90  | 91  | 89  | 87  | 87 | 85 | 83 | 81 |
| 2                   | 99   | 91  | 85  | 80  | 96  | 89  | 83  | 78  | 85  | 80  | 76  | 81  | 77  | 73  | 77 | 74 | 71 | 69 |
| 3                   | 91   | 81  | 73  | 67  | 88  | 79  | 72  | 66  | 76  | 70  | 65  | 72  | 67  | 63  | 69 | 65 | 61 | 59 |
| 4                   | 84   | 72  | 64  | 58  | 81  | 71  | 63  | 57  | 68  | 61  | 56  | 65  | 59  | 55  | 62 | 57 | 53 | 51 |
| 5                   | 77   | 65  | 57  | 50  | 75  | 64  | 56  | 50  | 61  | 54  | 49  | 59  | 53  | 48  | 56 | 51 | 47 | 45 |
| 6                   | 72   | 59  | 50  | 44  | 69  | 58  | 50  | 44  | 56  | 48  | 43  | 53  | 47  | 43  | 51 | 46 | 42 | 40 |
| 7                   | 67   | 54  | 45  | 39  | 65  | 53  | 45  | 39  | 51  | 44  | 39  | 49  | 43  | 38  | 47 | 42 | 37 | 35 |
| 8                   | 62   | 49  | 41  | 35  | 60  | 48  | 41  | 35  | 47  | 40  | 35  | 45  | 39  | 34  | 43 | 38 | 34 | 32 |
| 9                   | 58   | 45  | 37  | 32  | 57  | 44  | 37  | 32  | 43  | 36  | 31  | 42  | 35  | 31  | 40 | 35 | 31 | 29 |
| 10                  | 55   | 42  | 34  | 29  | 53  | 41  | 34  | 29  | 40  | 33  | 29  | 39  | 33  | 28  | 37 | 32 | 28 | 26 |

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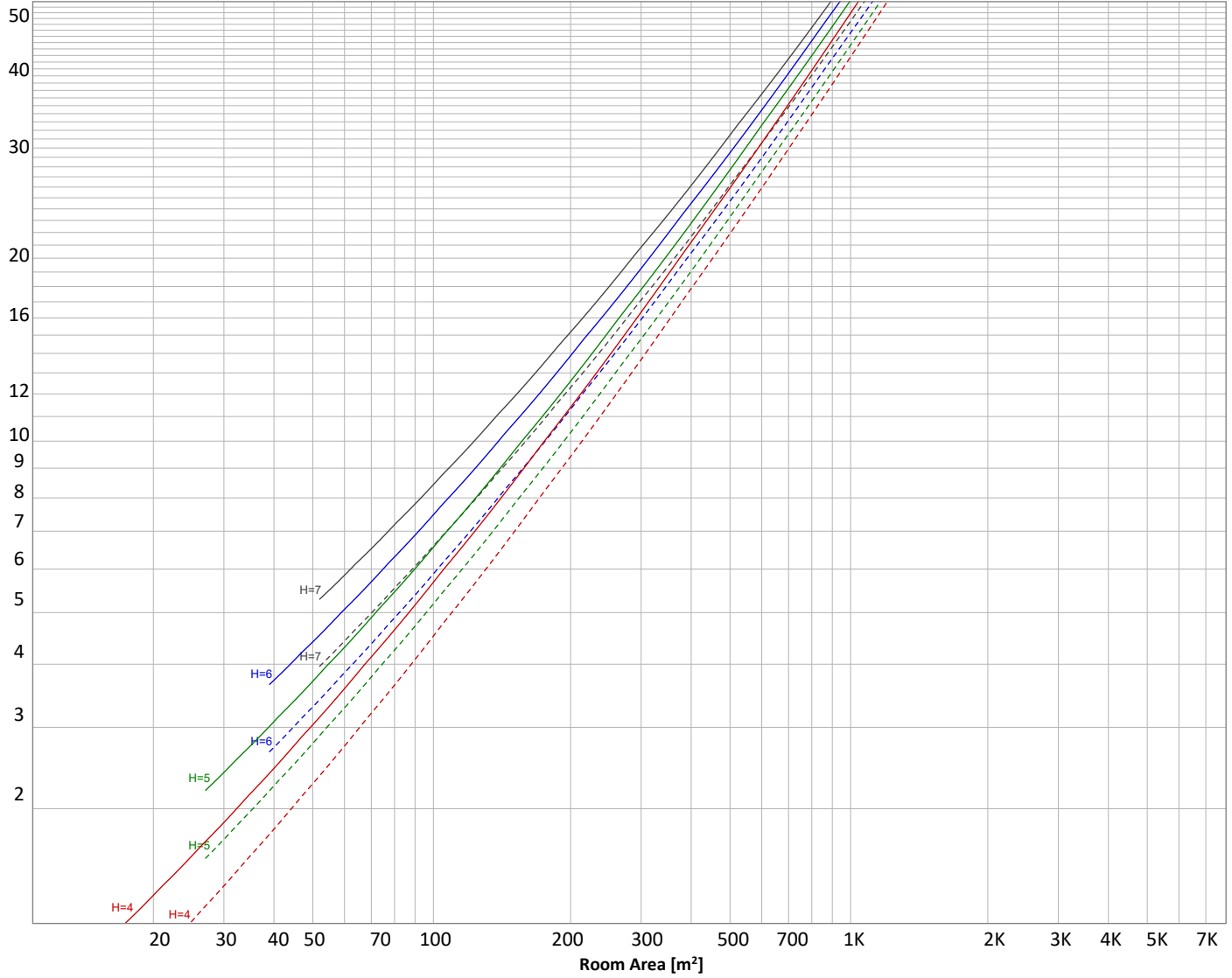
Operator:



## Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



### Conditions

|   |                |           |                     |                          |                   |
|---|----------------|-----------|---------------------|--------------------------|-------------------|
| H = Room height                                   | Flux = 2551 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°   |
| 93,6 lm  | 279 lm    | 423 lm    | 457 lm    | 427 lm    | 352 lm    | 219 lm    | 114 lm    | 60,1 lm   |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 31,6 lm  | 31,5 lm   | 22,5 lm   | 17,7 lm   | 12,3 lm   | 6,56 lm   | 2,88 lm   | 1,04 lm   | 0,235 lm  |

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Measurement date and time: 15-8-2025 09:23:50 – Measurement no. VFR-250815-2563-MS

Measurement tracking No. and Link: [VT250815-000098](#)

Operator:



## Outdoor Light Planning

### Lumen per Zone

| Zone (γ)     | Lumen          | % Total       |
|--------------|----------------|---------------|
| 0-10°        | 94 lm          | 3,7%          |
| 10-20°       | 279 lm         | 10,9%         |
| 20-30°       | 423 lm         | 16,6%         |
| 30-40°       | 457 lm         | 17,9%         |
| 40-50°       | 427 lm         | 16,7%         |
| 50-60°       | 352 lm         | 13,8%         |
| 60-70°       | 219 lm         | 8,6%          |
| 70-80°       | 114 lm         | 4,5%          |
| 80-90°       | 60 lm          | 2,4%          |
| 90-100°      | 32 lm          | 1,2%          |
| 100-110°     | 31 lm          | 1,2%          |
| 110-120°     | 22 lm          | 0,9%          |
| 120-130°     | 18 lm          | 0,7%          |
| 130-140°     | 12 lm          | 0,5%          |
| 140-150°     | 7 lm           | 0,3%          |
| 150-160°     | 3 lm           | 0,1%          |
| 160-170°     | 1 lm           | 0,0%          |
| 170-180°     | 0 lm           | 0,0%          |
| <b>Total</b> | <b>2551 lm</b> | <b>100,0%</b> |

### Intensity peaks

|                |        |
|----------------|--------|
| Max intensity  | 997 cd |
| Intensity, 90° | 36 cd  |
| Intensity, 0°  | 996 cd |

### Zonal Lumen summary

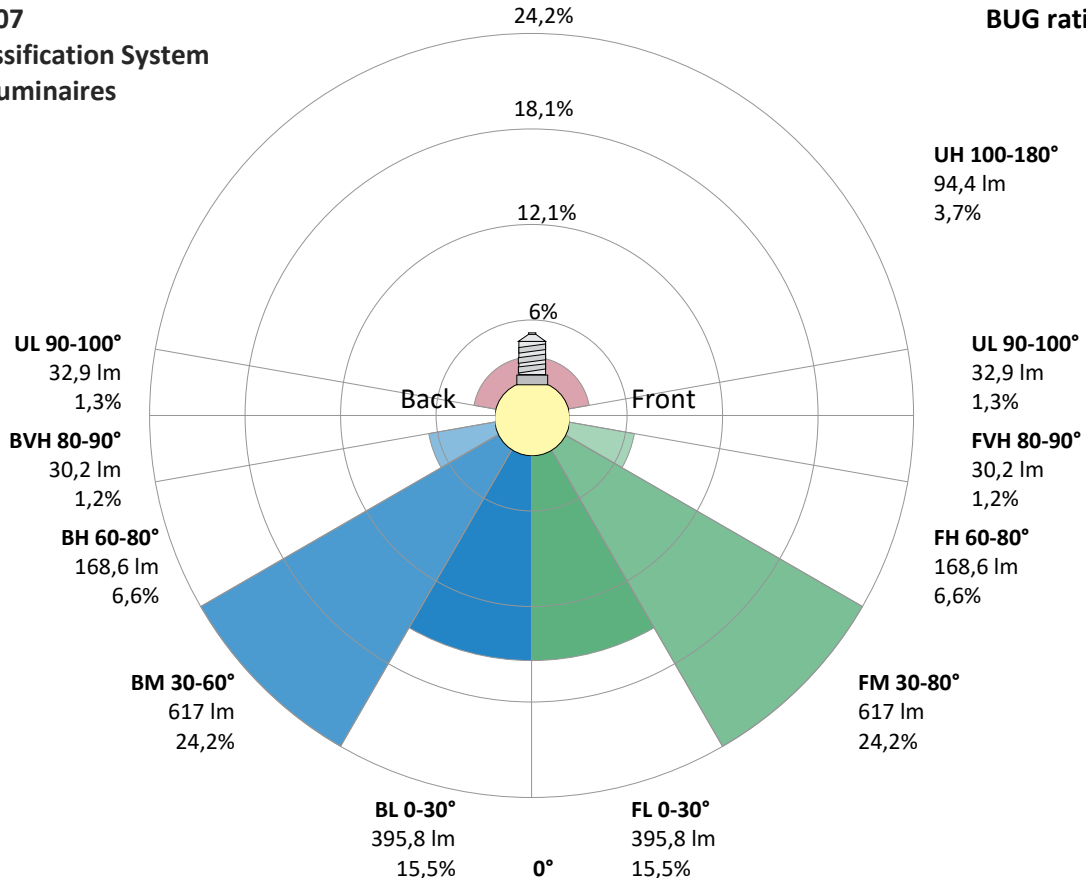
| Zone (γ) | Lumen   | % Total |
|----------|---------|---------|
| 0-30°    | 795 lm  | 31,2%   |
| 0-40°    | 1252 lm | 49,1%   |
| 0-60°    | 2031 lm | 79,6%   |
| 60-90°   | 394 lm  | 15,4%   |
| 70-100°  | 206 lm  | 8,1%    |
| 90-120°  | 86 lm   | 3,4%    |
| 0-90°    | 2425 lm | 95,1%   |
| 90-180°  | 126 lm  | 4,9%    |
| 0-180°   | 2551 lm | 100,0%  |

### BUG rating

|                      | Lumen  | % Total |
|----------------------|--------|---------|
| <b>Forward light</b> |        |         |
| Low(0-30°)           | 396 lm | 15,5%   |
| Medium(30-60°)       | 617 lm | 24,2%   |
| High(60-80°)         | 169 lm | 6,6%    |
| Very high(80-90°)    | 30 lm  | 1,2%    |
| <b>Back light</b>    |        |         |
| Low(0-30°)           | 396 lm | 15,5%   |
| Medium(30-60°)       | 617 lm | 24,2%   |
| High(60-80°)         | 169 lm | 6,6%    |
| Very high(80-90°)    | 30 lm  | 1,2%    |
| <b>Uplight</b>       |        |         |
| Low(90-100°)         | 33 lm  | 1,3%    |
| High(100-180°)       | 94 lm  | 3,7%    |

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

BUG rating B1 U3 G1



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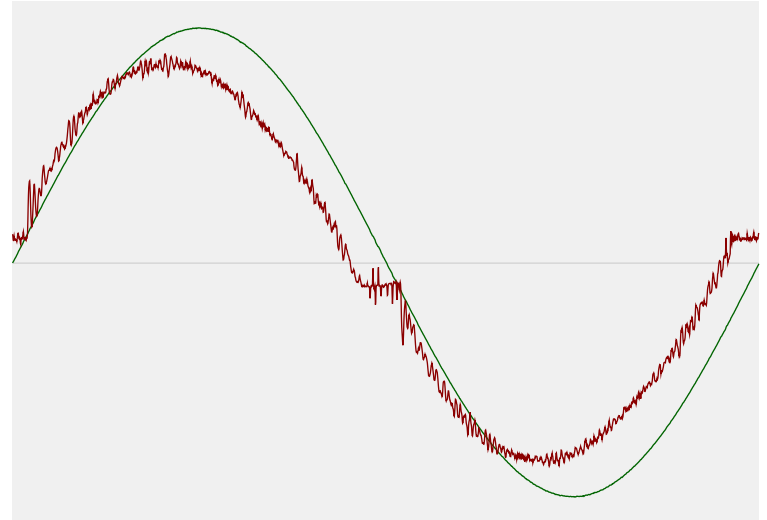


## Power Details

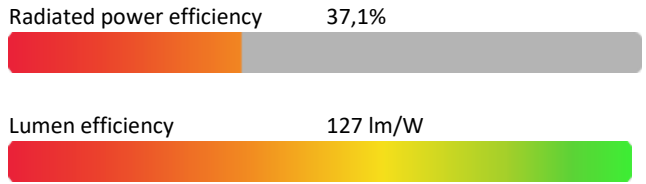
### Input Power

|   |          |
|---|----------|
| Power feed to light source                          | 20,1 W   |
| Frequency of input power                            | 50 Hz    |
| RMS Input voltage feed, $V_{RMS}$                   | 230 V    |
| RMS Input current feed, $I_{RMS}$                   | 0,090 A  |
| Volt-Ampere or apparent power = $V_{RMS} * I_{RMS}$ | 20,77 VA |
| Displacement factor of AC power feed                | 0,97     |
| Power factor of AC current feed                     | 0,97     |
| Total harmonic distortion of the current            | 6,71%    |
| 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 | 4999 K |
| CCT shift | +1 K   |
| CCT end   | 5000 K |

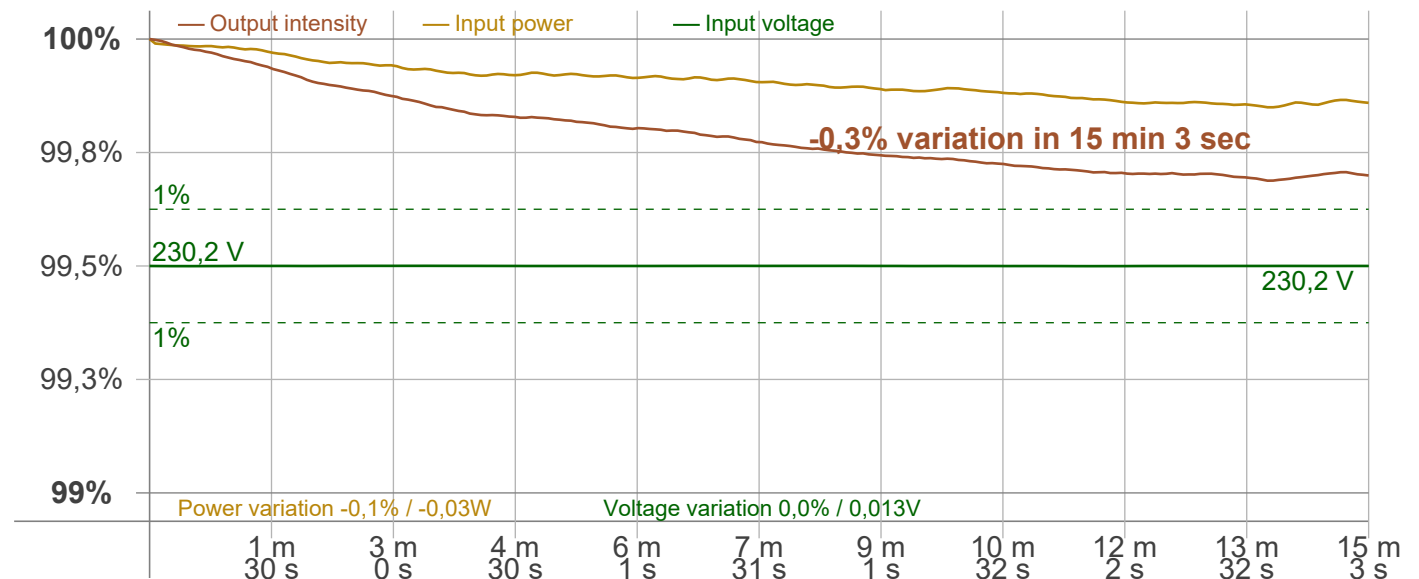
### Warmup Result

|                   |                                 |
|-------------------|---------------------------------|
| Total warmup time | Lamp stabilized in 15 min 3 sec |
| Warmup variation  | -0,3%                           |

### Output Change

|               |         |
|---------------|---------|
| Output start  | 2559 lm |
| Output change | -8 lm   |
| Output end    | 2551 lm |

### Stabilization Curve



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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: 98,04 Hz  
 Percent Flicker: 0,1 %  
 Flicker index: 0

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

JA8/10 40 Hz: 0,02 %  
 JA8/10 90 Hz: 0,02 %  
 JA8/10 200 Hz: 0,08 %  
 JA8/10 400 Hz: 0,09 %  
 JA8/10 1000 Hz: 0,09 %

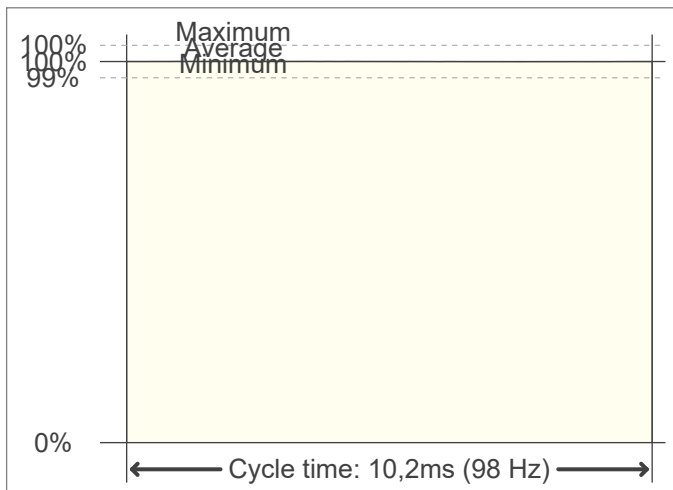
### TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)

PstLM value (F < 80 Hz): 0,01  
 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

