

# Light Measurement Report

Print date: 4-11-2024  
Measurement date and time: 4-11-2024 13:00:31 – Measurement no. VFR-241104-1862-MS  
Measurement tracking No. and Link: [VT241104-009913](#)  
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

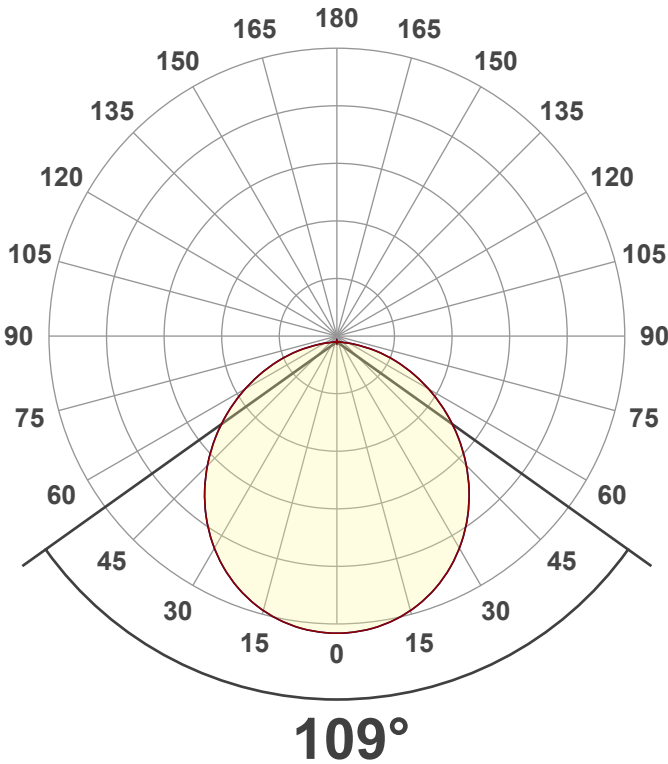
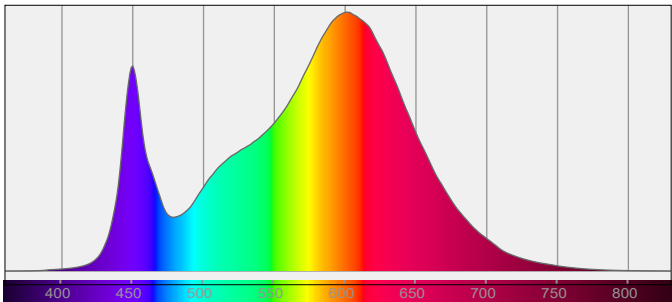
|                                       |                                        |
|---------------------------------------|----------------------------------------|
| Number of C-planes and Resolution     | 12 planes – 30°                        |
| γ (gamma)-Resolution                  | 5°                                     |
| Test Distance                         | 1,99 m                                 |
| Input Power, Power and Displ. Factors | 9,4 W – PF 0,95 – DPF 0,95             |
| Input RMS Voltage and Current         | 230 V – 0,043 A                        |
| Frequency of Input Power              | 50 Hz                                  |
| Warm-up Time and Variation            | Lamp stabilized in 15 min 3 sec – 2,0% |

## Tested Light Source

|                              |                                                  |
|------------------------------|--------------------------------------------------|
| Product Name                 | 273900-3000K                                     |
| Item No. and Manufacturer    | 273900-3000K – Dutchfulfillment                  |
| Product Description (line 1) | LED DOWNLIGHT   UMBRIEL   SLIM   Ø126   9W   WIT |

## Main Light Measurement Results

|                                               |                                           |
|-----------------------------------------------|-------------------------------------------|
| Output – Total Lumen (Up% / Down%)            | 789 lm – 0,14% / 99,86%                   |
| Efficiency                                    | 84 lm/W                                   |
| Peak Intensity and Beam Angle                 | 286 cd – 109°                             |
| Correlated Color Temperature, Target/Measured | CCT = 3000 K / 3094 K                     |
| Color Rendering Index                         | CRI 83,0                                  |
| Color Rendering TM30-18                       | R <sub>f</sub> 83,2 – R <sub>g</sub> 98,9 |
| Color Shift, CIE duv and MacAdam Steps        | Duv -0,0083 – SDCM 9,2                    |
| Flicker                                       | SVM 0 – PstLM 0,07                        |



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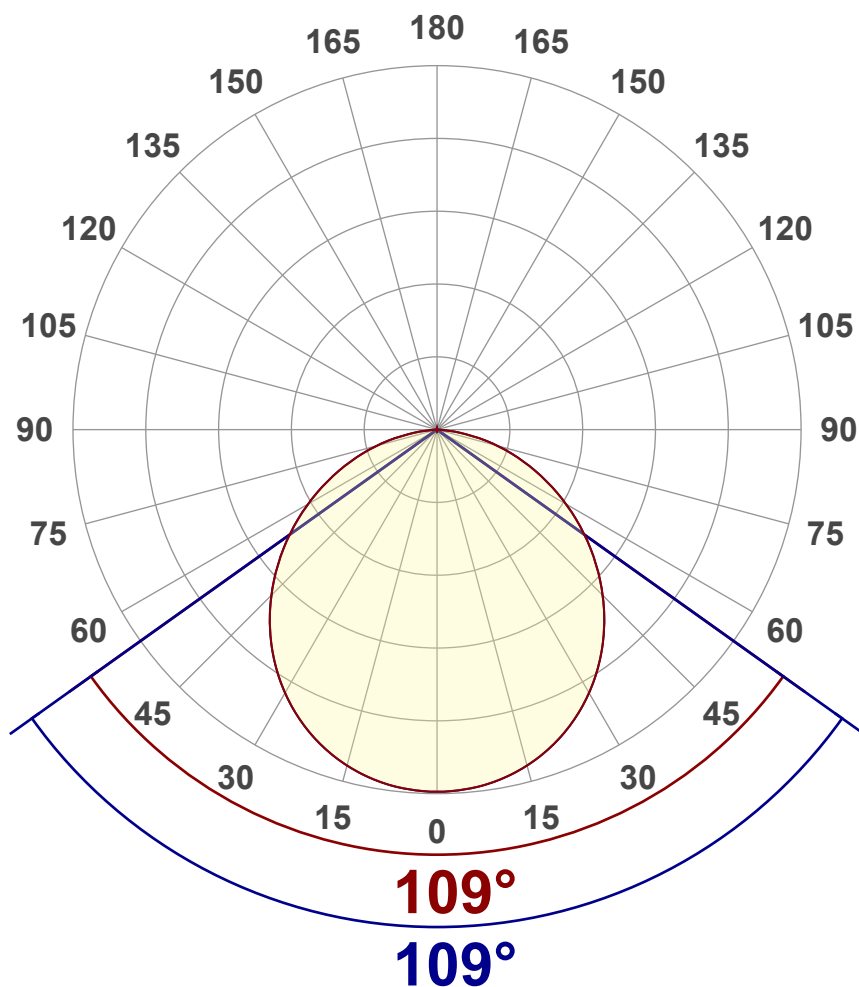
Measurement tracking No. and Link: [VT241104-009913](#)

Operator:



## Luminous Intensity diagram

Unit: 0-100% of peak intensity



## Main Values

|                      |                |
|----------------------|----------------|
| Output (total Lumen) | 789 lm         |
| Lumen Up% / Down%    | 0,14% / 99,86% |
| Peak Intensity       | 286 cd         |
| Beam Angle (50%)     | 109°           |
| Beam Angle (90%)     | 109°           |
| Beam Angle (10%)     | 109°           |

## Cut-off Angle

|              |        |
|--------------|--------|
| Average 2,5% | 171,6° |
|--------------|--------|

## Field Angle

|             |        |
|-------------|--------|
| Average 10% | 159,6° |
|-------------|--------|

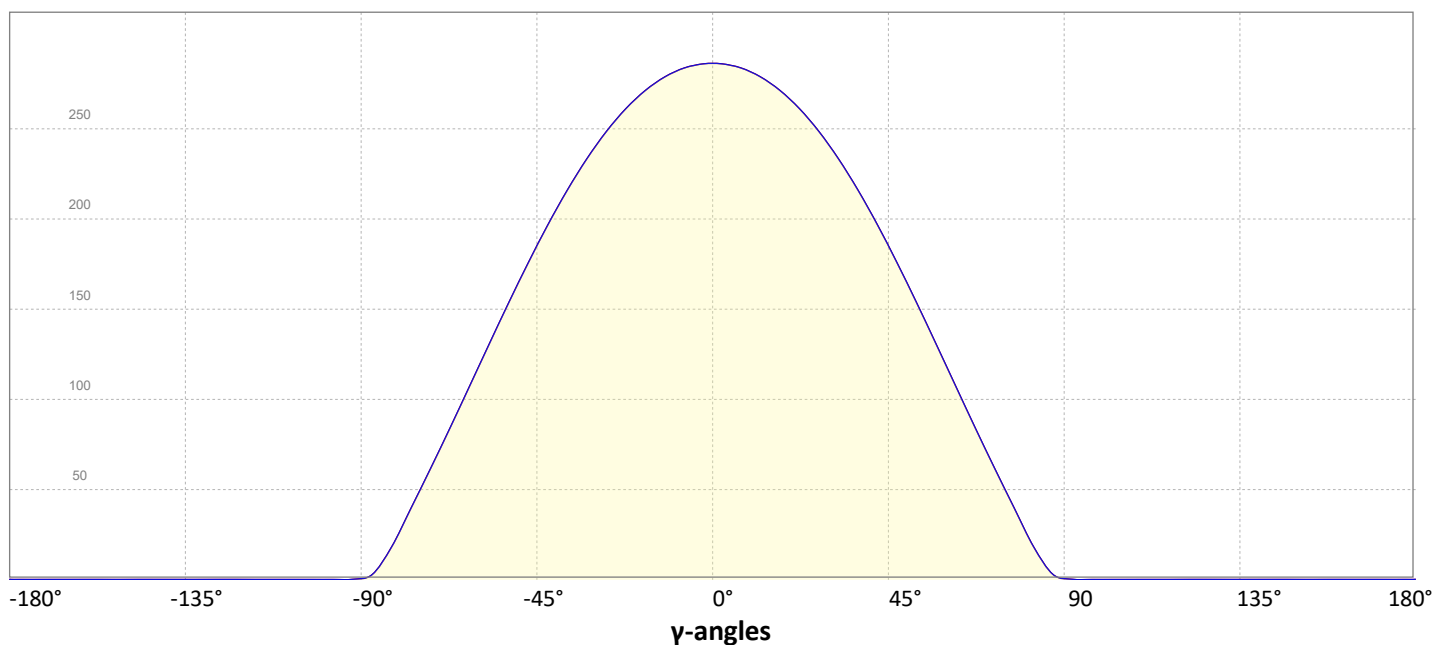
## Intensity Ratio

|              |       |
|--------------|-------|
| In 120° cone | 80,0% |
| In 90° cone  | 55,1% |

C000-C180

C090-C270

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

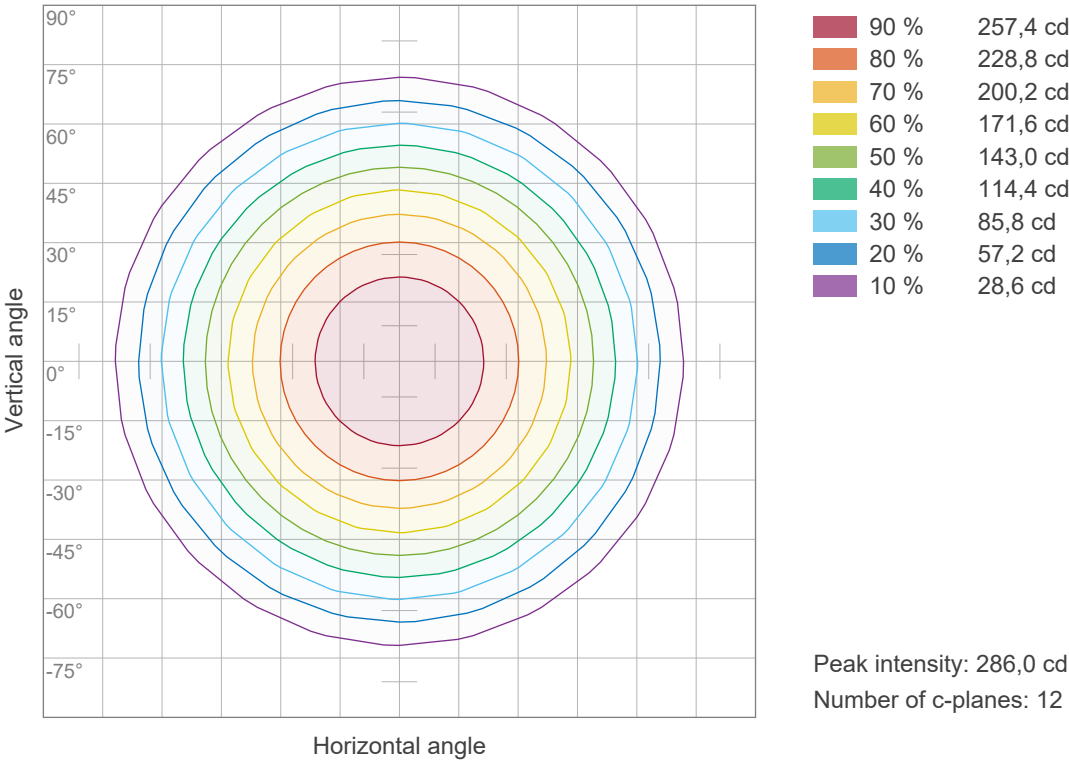


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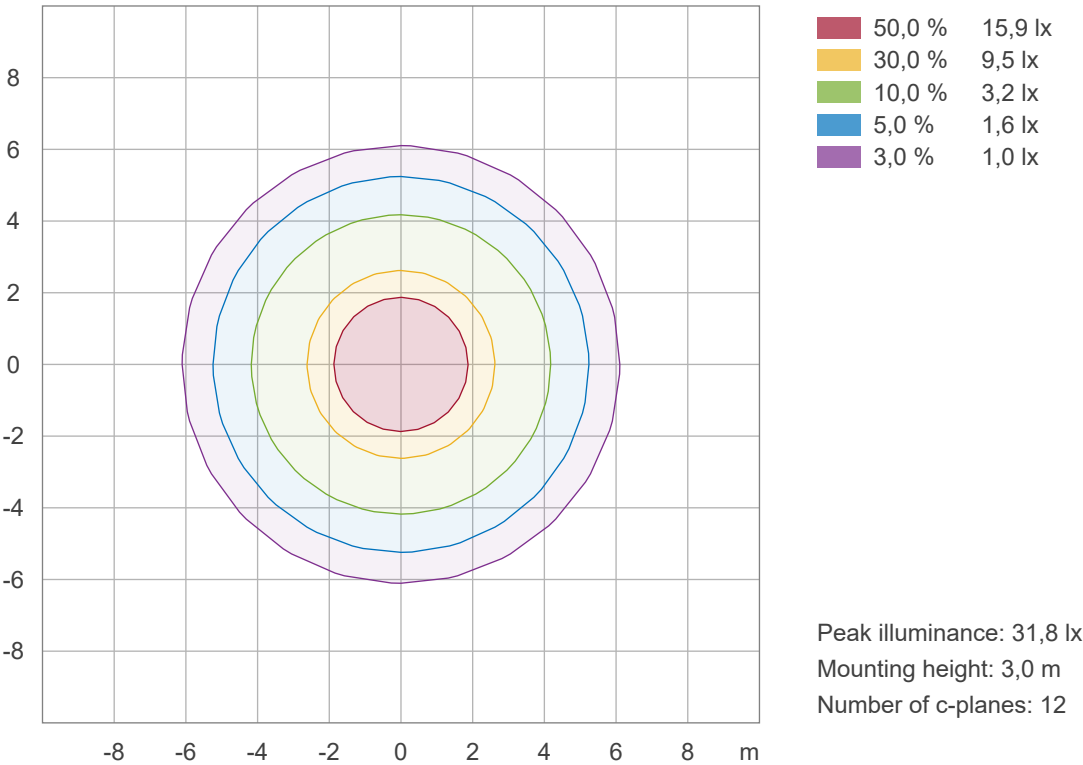
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## Iso-intensity Diagram (Iso-candela)



## Iso-illuminance Diagram (Iso-lux)



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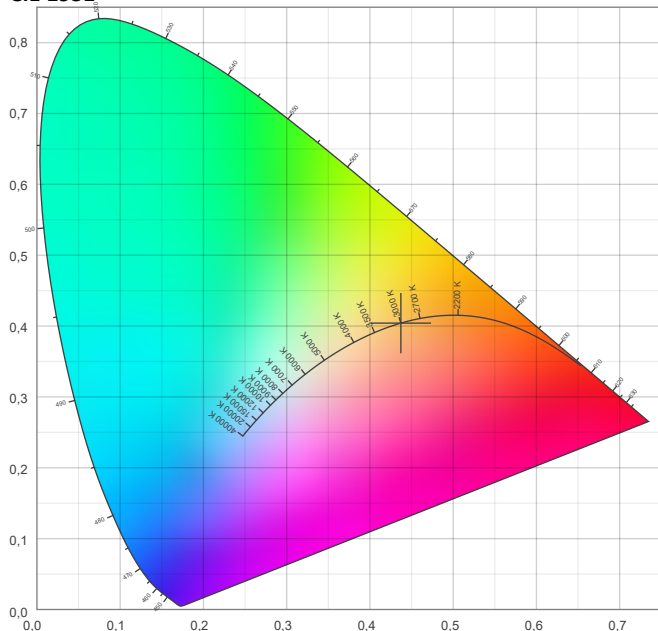


## Color details

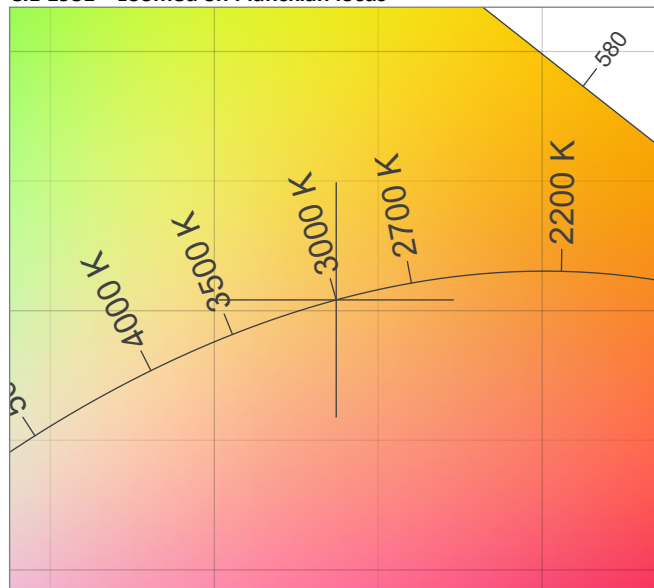
Correlated Color Temperature, Target CCT = 3000 K  
Correlated Color Temperature, Measured CCT = 3094 K  
Color Rendering Index CRI 83,0  
Color Rendering Index, R9 (red component) R9 = 8,7  
Color Rendering TM30-18  $R_f$  83,2 –  $R_g$  98,9  
Color Quality Scale CQS = 79,9

MacAdam Steps  
Color coordinates CIE 1931 (x;y) = (0,437;0,404)  
Color coordinate CIEs 1960 (u;v) = (0,251;0,348)  
Color deviation from BBL Duv = -0,0083  
Color coordinate CIEs 1976 (CIELUV) (u';v') = (0,251;0,521)

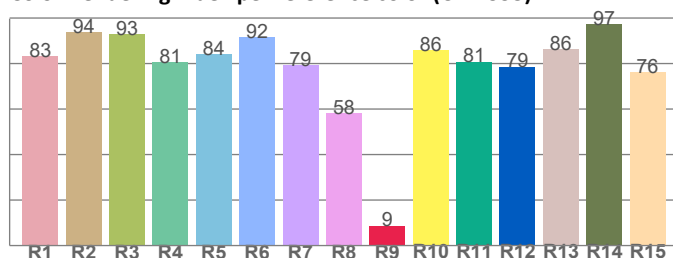
## CIE 1931



## CIE 1931 – zoomed on Planckian locus



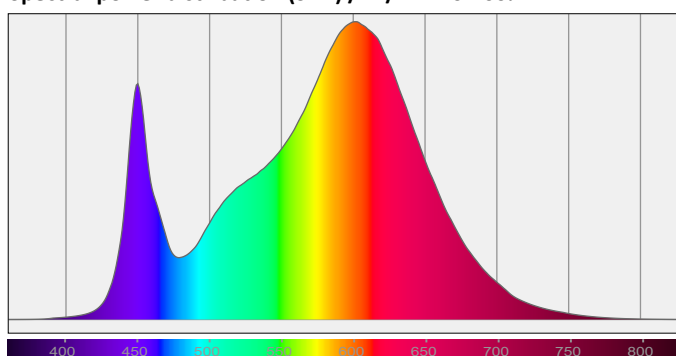
## Color Rendering Index per reference color (CIE 1995)



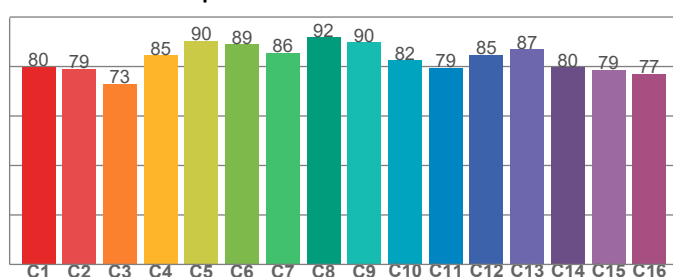
CRI R values, only R1-R8 are used to calculate final CRI value

| R1   | R2   | R3   | R4   | R5   | R6   | R7   | R8   | R9  | R10  | R11  | R12  | R13  | R14  | R15  |
|------|------|------|------|------|------|------|------|-----|------|------|------|------|------|------|
| 83,2 | 93,8 | 93,0 | 80,6 | 84,2 | 91,5 | 79,3 | 58,0 | 8,7 | 86,0 | 80,8 | 78,6 | 86,3 | 97,1 | 76,3 |

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



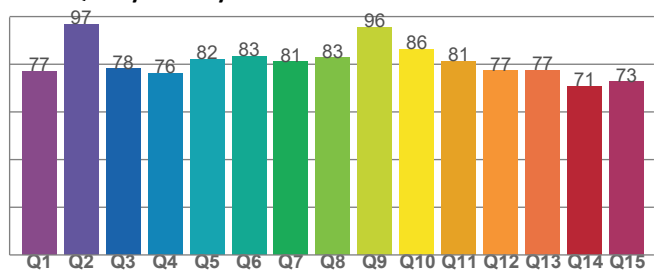
## TM30-18 Rf-values per hue bin



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  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 80,0 | 79,1 | 73,0 | 84,6 | 90,4 | 89,0 | 85,5 | 91,9 | 89,8 | 82,5 | 79,4 | 84,7 | 87,1 | 79,7 | 78,7 | 77,1 |

## Color Quality Scale by reference color



CQS Q values

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 77,1 | 96,7 | 78,2 | 76,3 | 82,0 | 83,4 | 81,0 | 82,7 | 95,5 | 86,4 | 81,2 | 77,2 | 77,4 | 70,8 | 72,6 |

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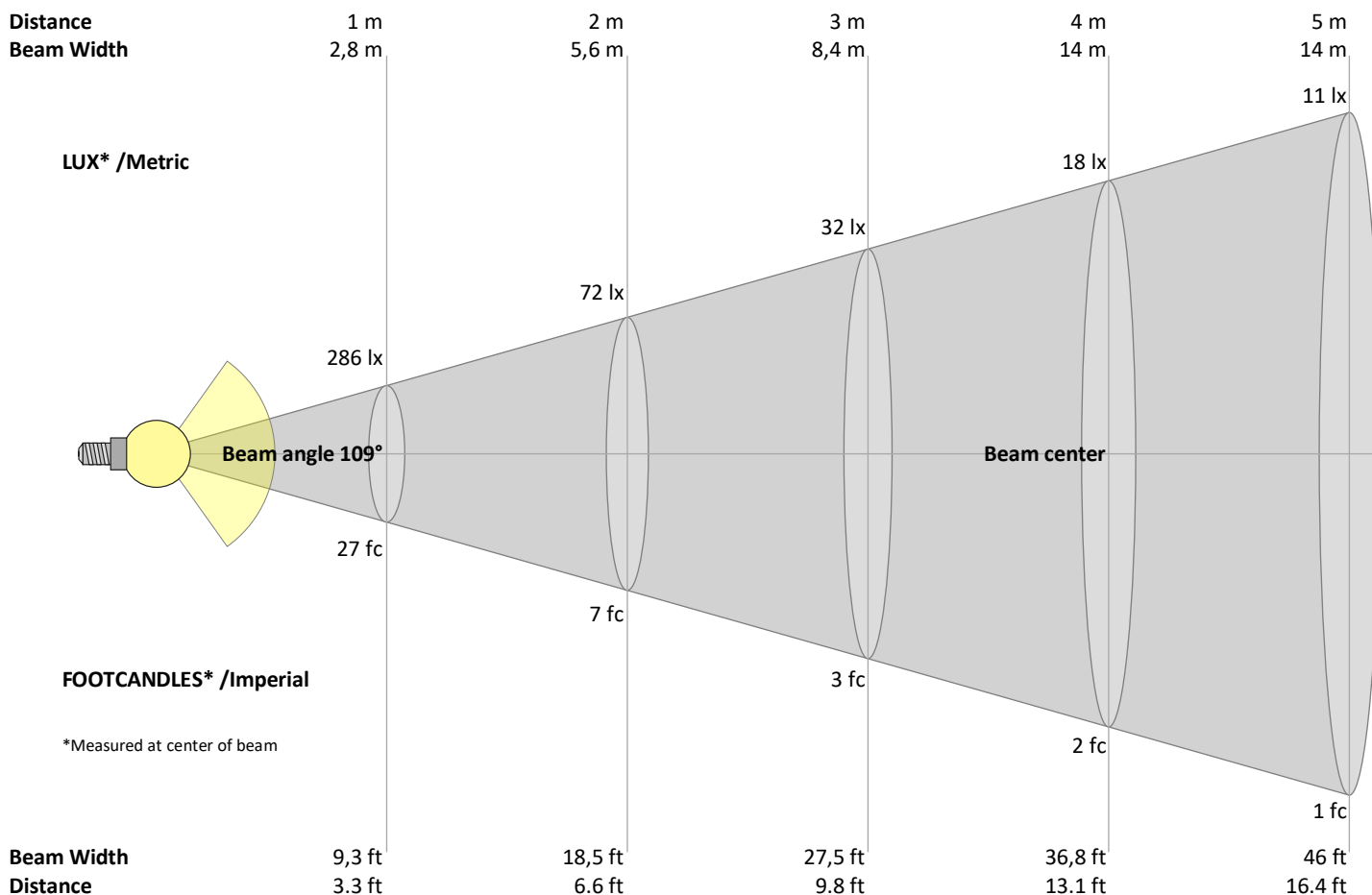
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## Beam Details



## 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  |
| 286  | 72  | 32  | 18   | 11   | 8    | 6   | 4    | 4    | 3    | 2    | 2    | 2    | 1    | 1    | 1    | 1    | 1    | 1    | 1    | lux |
| 26,6 | 6,6 | 3   | 1,7  | 1,1  | 0,7  | 0,5 | 0,4  | 0,3  | 0,3  | 0,2  | 0,2  | 0,2  | 0,1  | 0,1  | 0,1  | 0,1  | 0,1  | 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        |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 286  | 285  | 281 | 275 | 266 | 254 | 240 | 224 | 205 | 185 | 163 | 141 | 118 | 95  | 72  | 49  | 28  | 10  | 1   | 0   | cd       |
| 100% | 100% | 98% | 96% | 93% | 89% | 84% | 78% | 72% | 65% | 57% | 49% | 41% | 33% | 25% | 17% | 10% | 3%  | 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        |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 286  | 285  | 281 | 275 | 266 | 254 | 240 | 224 | 205 | 185 | 163 | 141 | 118 | 95  | 72  | 49  | 28  | 10  | 1   | 0   | cd       |
| 100% | 100% | 98% | 96% | 93% | 89% | 84% | 78% | 72% | 65% | 57% | 49% | 41% | 33% | 25% | 17% | 10% | 3%  | 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        |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 286  | 285  | 281 | 275 | 266 | 254 | 240 | 224 | 205 | 185 | 163 | 141 | 118 | 95  | 72  | 49  | 28  | 10  | 1   | 0   | cd       |
| 100% | 100% | 98% | 96% | 93% | 89% | 84% | 78% | 72% | 65% | 57% | 49% | 41% | 33% | 25% | 17% | 10% | 3%  | 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        |
|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----------|
| 286  | 285  | 281 | 275 | 266 | 254 | 240 | 224 | 205 | 185 | 163 | 141 | 118 | 95  | 72  | 49  | 28  | 10  | 1   | 0   | cd       |
| 100% | 100% | 98% | 96% | 93% | 89% | 84% | 78% | 72% | 65% | 57% | 49% | 41% | 33% | 25% | 17% | 10% | 3%  | 0%  | 0%  | of 0°val |

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## Light Planning – UGR table

Uncorrected, comprehensive UGR table according to 117-1995

| Reflectances                                                         |           |                                                    |      |      |      |      |                                                  |      |      |      |      |
|----------------------------------------------------------------------|-----------|----------------------------------------------------|------|------|------|------|--------------------------------------------------|------|------|------|------|
|                                                                      | p Ceiling | 70                                                 | 70   | 50   | 50   | 30   | 70                                               | 70   | 50   | 50   | 30   |
|                                                                      | p Walls   | 50                                                 | 30   | 50   | 30   | 30   | 50                                               | 30   | 50   | 30   | 30   |
|                                                                      | p 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        | 24,3                                               | 25,5 | 24,5 | 25,8 | 26,0 | 24,3                                             | 25,5 | 24,5 | 25,8 | 26,0 |
|                                                                      | 3H        | 25,5                                               | 26,8 | 25,9 | 27,1 | 27,3 | 25,5                                             | 26,8 | 25,9 | 27,1 | 27,3 |
|                                                                      | 4H        | 26,0                                               | 27,2 | 26,4 | 27,5 | 27,8 | 26,0                                             | 27,2 | 26,4 | 27,5 | 27,8 |
|                                                                      | 6H        | 26,4                                               | 27,4 | 26,7 | 27,7 | 28,1 | 26,4                                             | 27,4 | 26,7 | 27,7 | 28,1 |
|                                                                      | 8H        | 26,4                                               | 27,5 | 26,8 | 27,8 | 28,2 | 26,4                                             | 27,5 | 26,8 | 27,8 | 28,2 |
|                                                                      | 12H       | 26,4                                               | 27,4 | 26,8 | 27,8 | 28,2 | 26,4                                             | 27,4 | 26,8 | 27,8 | 28,2 |
| 4H                                                                   | 2H        | 24,8                                               | 26,0 | 25,2 | 26,3 | 26,5 | 24,8                                             | 26,0 | 25,2 | 26,3 | 26,5 |
|                                                                      | 3H        | 26,4                                               | 27,4 | 26,7 | 27,7 | 28,1 | 26,4                                             | 27,4 | 26,7 | 27,7 | 28,1 |
|                                                                      | 4H        | 26,9                                               | 27,8 | 27,3 | 28,2 | 28,8 | 26,9                                             | 27,8 | 27,3 | 28,2 | 28,8 |
|                                                                      | 6H        | 27,3                                               | 28,2 | 27,8 | 28,5 | 28,9 | 27,3                                             | 28,2 | 27,8 | 28,5 | 28,9 |
|                                                                      | 8H        | 27,4                                               | 28,2 | 27,9 | 28,5 | 28,9 | 27,4                                             | 28,2 | 27,9 | 28,5 | 28,9 |
|                                                                      | 12H       | 27,4                                               | 28,1 | 27,9 | 28,5 | 29,0 | 27,4                                             | 28,1 | 27,9 | 28,5 | 29,0 |
| 8H                                                                   | 4H        | 27,1                                               | 27,9 | 27,6 | 28,3 | 28,7 | 27,1                                             | 27,9 | 27,6 | 28,3 | 28,7 |
|                                                                      | 6H        | 27,6                                               | 28,2 | 28,1 | 28,7 | 29,2 | 27,6                                             | 28,2 | 28,1 | 28,7 | 29,2 |
|                                                                      | 8H        | 27,8                                               | 28,3 | 28,3 | 28,8 | 29,5 | 27,8                                             | 28,3 | 28,3 | 28,8 | 29,5 |
|                                                                      | 12H       | 27,9                                               | 28,3 | 28,4 | 28,8 | 29,4 | 27,9                                             | 28,3 | 28,4 | 28,8 | 29,4 |
| 12H                                                                  | 4H        | 27,1                                               | 27,8 | 27,6 | 28,2 | 28,7 | 27,1                                             | 27,8 | 27,6 | 28,2 | 28,7 |
|                                                                      | 6H        | 27,7                                               | 28,2 | 28,2 | 28,7 | 29,4 | 27,7                                             | 28,2 | 28,2 | 28,7 | 29,4 |
|                                                                      | 8H        | 27,8                                               | 28,3 | 28,4 | 28,8 | 29,4 | 27,8                                             | 28,3 | 28,4 | 28,8 | 29,4 |
| Variations with the observer position for the luminaire spacings, S: |           |                                                    |      |      |      |      |                                                  |      |      |      |      |
| S = 1.0H                                                             |           | 0,1 / -0,1                                         |      |      |      |      | 0,1 / -0,1                                       |      |      |      |      |
| S = 1.5H                                                             |           | 0,2 / -0,4                                         |      |      |      |      | 0,2 / -0,4                                       |      |      |      |      |
| S = 2.0H                                                             |           | 0,6 / -0,7                                         |      |      |      |      | 0,6 / -0,7                                       |      |      |      |      |

## 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                   | 109 | 104                      | 100 | 96  | 106                                                                            | 102 | 98  | 95  | 98  | 95  | 92  | 94  | 91  | 89  | 90  | 88  | 86  | 84  |
| 2                   | 99  | 91                       | 84  | 79  | 97                                                                             | 89  | 83  | 78  | 86  | 80  | 76  | 82  | 78  | 74  | 79  | 76  | 72  | 70  |
| 3                   | 90  | 80                       | 72  | 66  | 88                                                                             | 78  | 71  | 65  | 75  | 69  | 64  | 73  | 67  | 63  | 70  | 65  | 62  | 59  |
| 4                   | 83  | 71                       | 62  | 56  | 81                                                                             | 70  | 61  | 55  | 67  | 60  | 54  | 65  | 59  | 54  | 63  | 57  | 53  | 51  |
| 5                   | 76  | 63                       | 55  | 48  | 74                                                                             | 62  | 54  | 48  | 60  | 53  | 47  | 58  | 52  | 47  | 56  | 51  | 46  | 44  |
| 6                   | 70  | 57                       | 48  | 42  | 68                                                                             | 56  | 48  | 42  | 54  | 47  | 41  | 53  | 46  | 41  | 51  | 45  | 41  | 38  |
| 7                   | 65  | 52                       | 43  | 37  | 64                                                                             | 51  | 43  | 37  | 49  | 42  | 37  | 48  | 41  | 36  | 47  | 41  | 36  | 34  |
| 8                   | 61  | 47                       | 39  | 33  | 59                                                                             | 47  | 39  | 33  | 45  | 38  | 33  | 44  | 37  | 32  | 43  | 37  | 32  | 30  |
| 9                   | 57  | 43                       | 35  | 30  | 55                                                                             | 43  | 35  | 30  | 42  | 34  | 29  | 41  | 34  | 29  | 40  | 34  | 29  | 27  |
| 10                  | 53  | 40                       | 32  | 27  | 52                                                                             | 40  | 32  | 27  | 39  | 32  | 27  | 38  | 31  | 27  | 37  | 31  | 26  | 25  |

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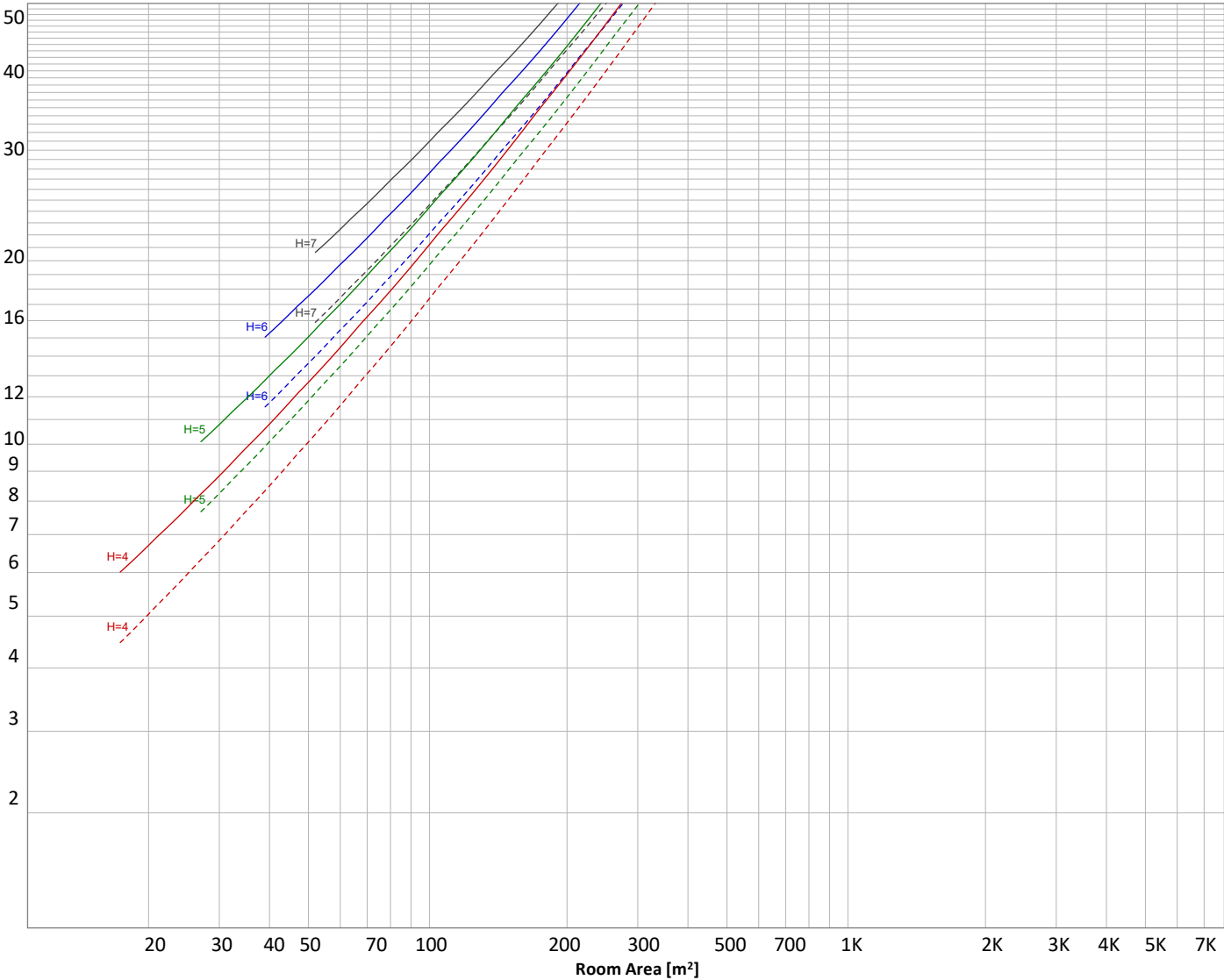
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## Luminaire budgetary diagram

Uncorrected, comprehensive UGR table according to 117-1995

LAMPS (number of lamps)



### Conditions

|                                                   |               |           |                     |                   |
|---------------------------------------------------|---------------|-----------|---------------------|-------------------|
| H = Room height                                   | Flux = 789 lm | p(%)      |                     |                   |
| H <sub>down</sub> = Lamp distance from ceiling =  | 0.00 m        | Line type | Ceiling reflectance | Wall reflectance  |
| H <sub>work</sub> = Work area height from floor = | 0.00 m        | -----     | 70                  | 50                |
| E <sub>work</sub> = Average lux on work area =    | 100 lx        | _____     | 50                  | 30                |
|                                                   |               |           |                     | Floor reflectance |
|                                                   |               |           |                     | 30                |
|                                                   |               |           |                     | 20                |

## Zonal Lumen Summary

|          |           |           |           |           |           |           |           |           |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 0°-10°   | 10°-20°   | 20°-30°   | 30°-40°   | 40°-50°   | 50°-60°   | 60°-70°   | 70°-80°   | 80°-90°   |
| 27,1 lm  | 77,6 lm   | 117 lm    | 140 lm    | 143 lm    | 126 lm    | 93,6 lm   | 52,2 lm   | 10,8 lm   |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 0,223 lm | 0,170 lm  | 0,170 lm  | 0,175 lm  | 0,139 lm  | 0,117 lm  | 0,080 lm  | 0,051 lm  | 0,016 lm  |

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## Outdoor Light Planning

### Lumen per Zone

| Zone (γ) | Lumen           | % Total |
|----------|-----------------|---------|
| 0-10°    | {LUM00-10} lm   | #VALUE! |
| 10-20°   | {LUM10-20} lm   | #VALUE! |
| 20-30°   | {LUM20-30} lm   | #VALUE! |
| 30-40°   | {LUM30-40} lm   | #VALUE! |
| 40-50°   | {LUM40-50} lm   | #VALUE! |
| 50-60°   | {LUM50-60} lm   | #VALUE! |
| 60-70°   | {LUM60-70} lm   | #VALUE! |
| 70-80°   | {LUM70-80} lm   | #VALUE! |
| 80-90°   | {LUM80-90} lm   | #VALUE! |
| 90-100°  | {LUM90-100} lm  | #VALUE! |
| 100-110° | {LUM100-110} lm | #VALUE! |
| 110-120° | {LUM110-120} lm | #VALUE! |
| 120-130° | {LUM120-130} lm | #VALUE! |
| 130-140° | {LUM130-140} lm | #VALUE! |
| 140-150° | {LUM140-150} lm | #VALUE! |
| 150-160° | {LUM150-160} lm | #VALUE! |
| 160-170° | {LUM160-170} lm | #VALUE! |
| 170-180° | {LUM170-180} lm | #VALUE! |
| Total    | 0 lm            | #VALUE! |

### Intensity peaks

|                |            |
|----------------|------------|
| Max intensity  | {PEAK} cd  |
| Intensity, 90° | {INT90} cd |
| Intensity, 0°  | {INT0} cd  |

### Zonal Lumen summary

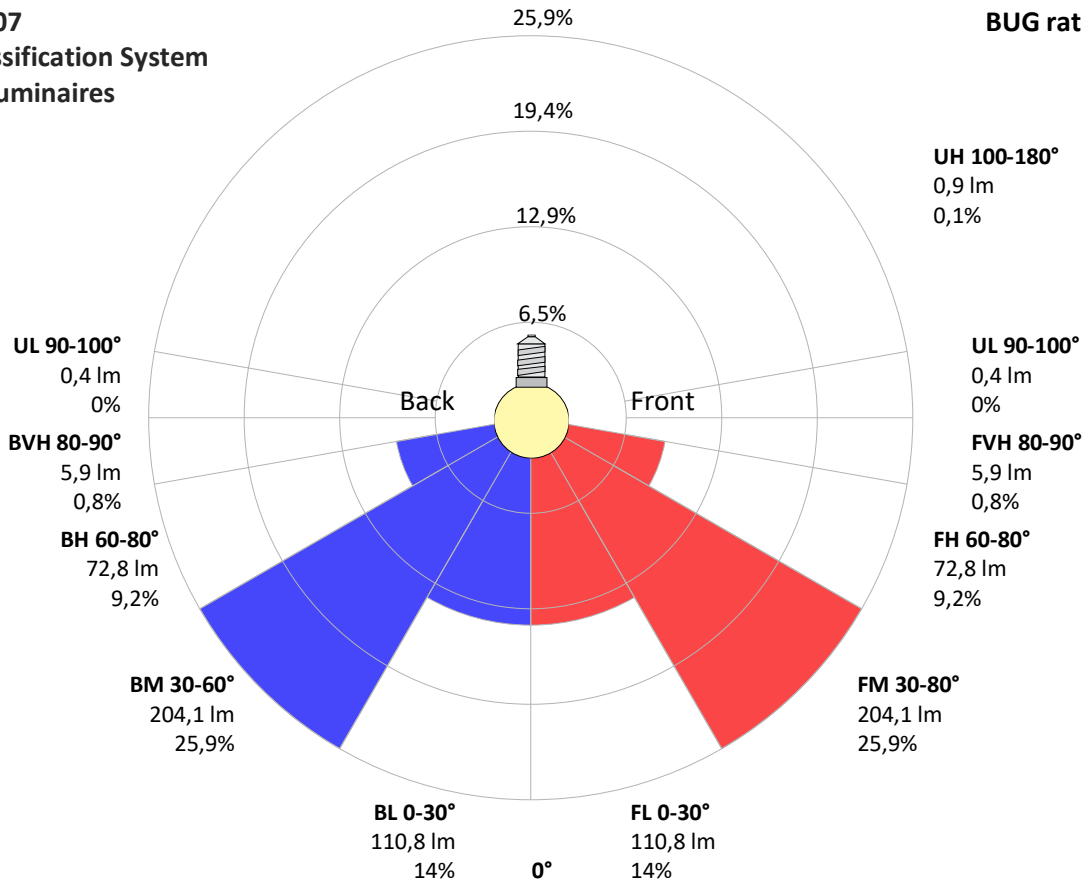
| Zone (γ) | Lumen          | % Total |
|----------|----------------|---------|
| 0-30°    | {LUM00-30} lm  | #VALUE! |
| 0-40°    | {LUM00-40} lm  | #VALUE! |
| 0-60°    | {LUM00-60} lm  | #VALUE! |
| 60-90°   | {LUM60-90} lm  | #VALUE! |
| 70-100°  | {LUM70-100} lm | #VALUE! |
| 90-120°  | {LUM90-120} lm | #VALUE! |
| 0-90°    | {LUM00-90} lm  | #VALUE! |
| 90-180°  | {LUM90-180} lm | #VALUE! |
| 0-180°   | {LUM00-180} lm | #VALUE! |

### BUG rating

|                      | Lumen     | % Total |
|----------------------|-----------|---------|
| <b>Forward light</b> |           |         |
| Low(0-30°)           | {BUG0} lm | #VALUE! |
| Medium(30-60°)       | {BUG1} lm | #VALUE! |
| High(60-80°)         | {BUG2} lm | #VALUE! |
| Very high(80-90°)    | {BUG3} lm | #VALUE! |
| <b>Back light</b>    |           |         |
| Low(0-30°)           | {BUG4} lm | #VALUE! |
| Medium(30-60°)       | {BUG5} lm | #VALUE! |
| High(60-80°)         | {BUG6} lm | #VALUE! |
| Very high(80-90°)    | {BUG7} lm | #VALUE! |
| <b>Uplight</b>       |           |         |
| Low(90-100°)         | {BUG8} lm | #VALUE! |
| High(100-180°)       | {BUG9} lm | #VALUE! |

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

BUG rating B1 U1 G0



Light Measurement Report

Print date: 4-11-2024  
Measurement date and time: 4-11-2024 13:00:31 – Measurement no. VFR-241104-1862-MS  
Measurement tracking No. and Link: [VT241104-009913](#)  
Operator:

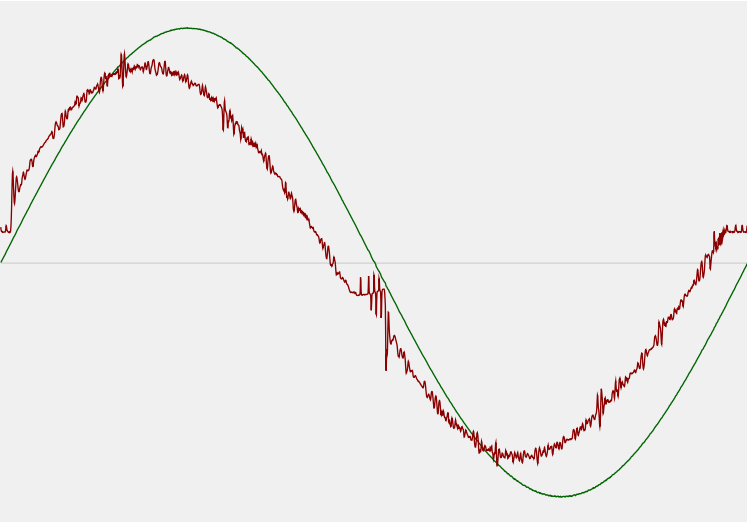


Power Details

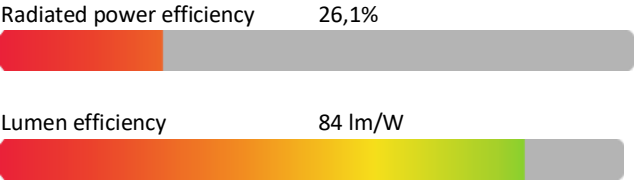
Input Power

|                                                         |         |
|---------------------------------------------------------|---------|
| Power feed to light source                              | 9,4 W   |
| Frequency of input power                                | 50 Hz   |
| RMS Input voltage feed, $V_{RMS}$                       | 230 V   |
| RMS Input current feed, $I_{RMS}$                       | 0,043 A |
| Volt-Ampere or apparent power = $V_{RMS} \cdot I_{RMS}$ | 9,89 VA |
| Displacement factor of AC power feed                    | 0,95    |
| Power factor of AC current feed                         | 0,95    |
| Total harmonic distortion of the current                | 6,06%   |
| Total harmonic distortion of the voltage                | 0,12%   |

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 | 2985 K |
| CCT shift | +15 K  |
| CCT end   | 3000 K |

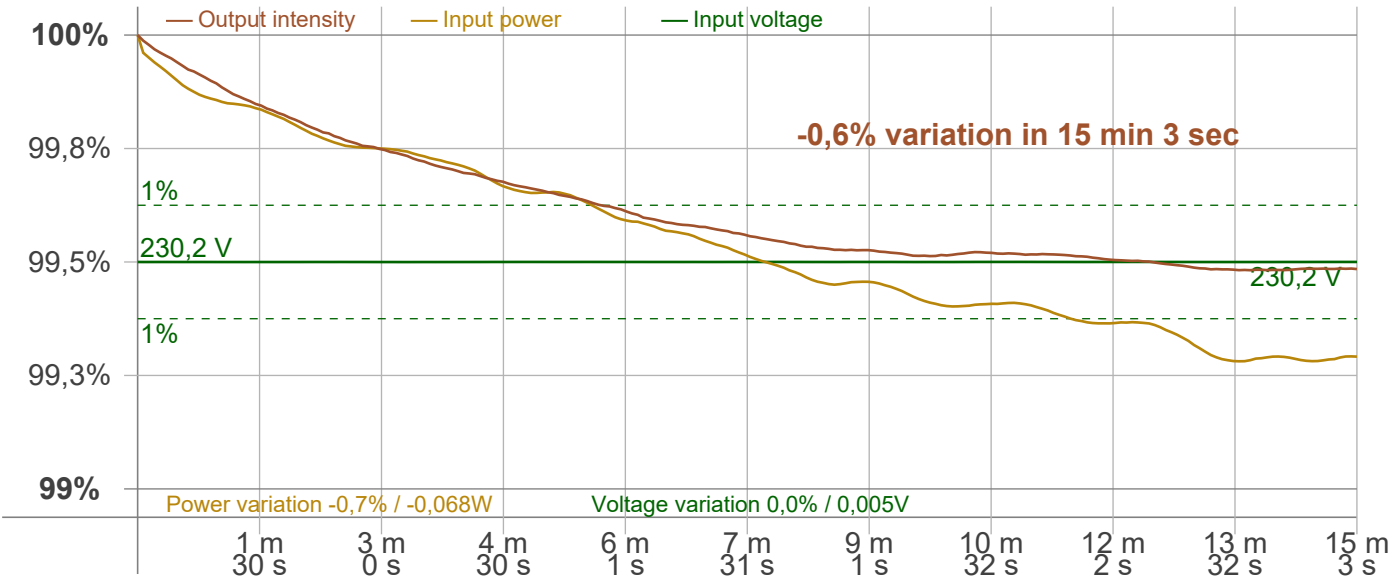
Warmup Result

|                   |                                 |
|-------------------|---------------------------------|
| Total warmup time | Lamp stabilized in 15 min 3 sec |
| Warmup variation  | -0,6%                           |

Output Change

|               |        |
|---------------|--------|
| Output start  | 793 lm |
| Output change | -4 lm  |
| Output end    | 789 lm |

Stabilization Curve



# Light Measurement Report

Print date: 4-11-2024  
Measurement date and time: 4-11-2024 13:00:31 – Measurement no. VFR-241104-1862-MS  
Measurement tracking No. and Link: [VT241104-009913](#)  
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

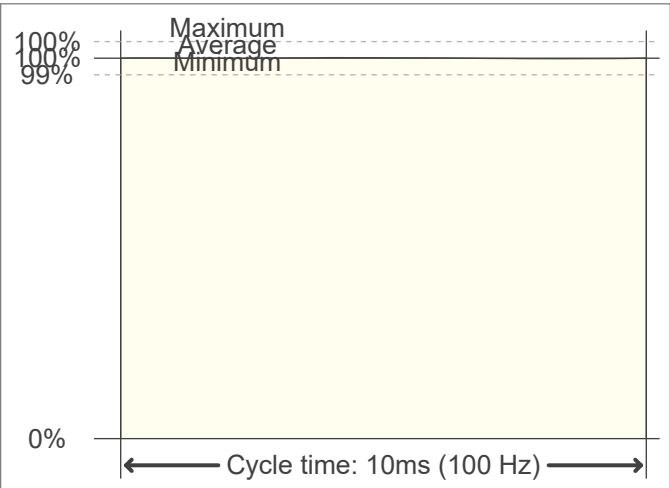
Flicker indices according to Illuminating Engineering Society (IES)  
Flicker frequency 100 Hz  
Percent Flicker 0,26 %  
Flicker index 0

Flicker indices according to California Energy Commission (CEC) 2016b  
JA8/10 40 Hz 0,1 %  
JA8/10 90 Hz 0,11 %  
JA8/10 200 Hz 0,22 %  
JA8/10 400 Hz 0,26 %  
JA8/10 1000 Hz 0,25 %

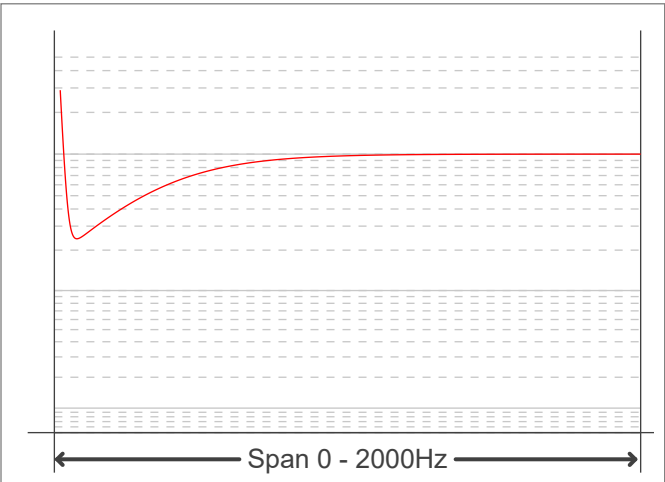
TLA indices (re IEC TR 61547-1, IEC 61000-3-3 and IEC 61000-4-15)  
PstLM value (F < 80 Hz) 0,07  
SVM value (80 < F < 2000 Hz) 0

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

