

#### Light efficiency:

85 Lumen/Watt

#### Light quality:

CRI: 96,0

#### Color temperature:

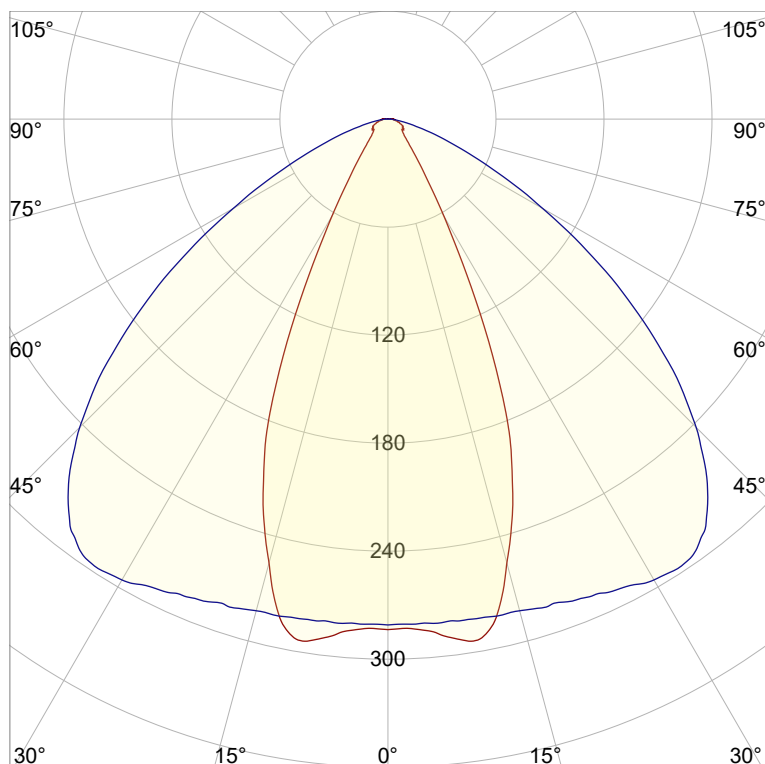
2753 K

Output: 389 lm

Peak: 297 cd

Power: 4,6 W

PF: 1,0



CIE 1931  
x: 0,455  
y: 0,409

#### Product name:

Horizon-0508-927-L3F-CST

#### Item number:

FLNNP/L/01A0508/927/L3F/CST

#### Date and time:

17.06.2020 16:03:24

#### Description:

Rank: G08DW

Toleranzen:

Lumen +/-4%

Candela +/-2,5%

Colour Temp +/-35 K

CRI +/-0,7

Angular Resolution 1 Grad Step

Last Calibration 20.05.2020

Pruefer:

Peter Ulrich

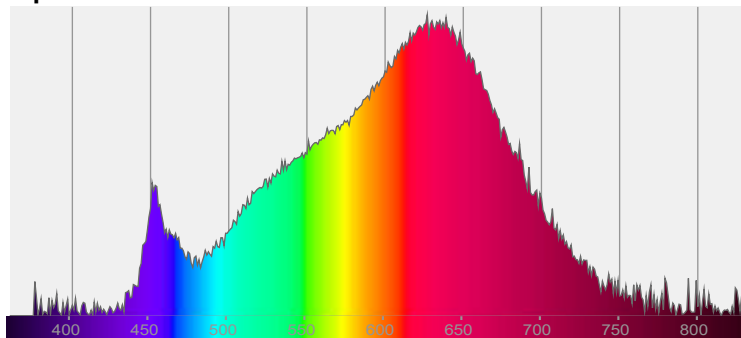
Pruefort:

Lichtlabor

Gaustrasse13

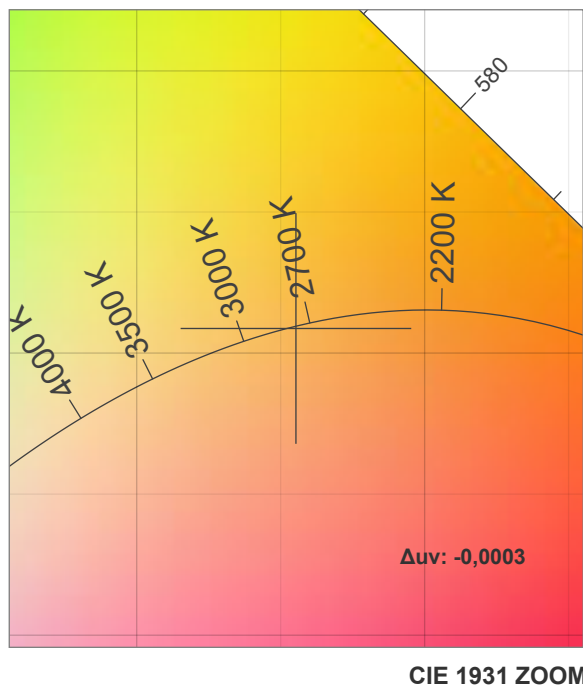
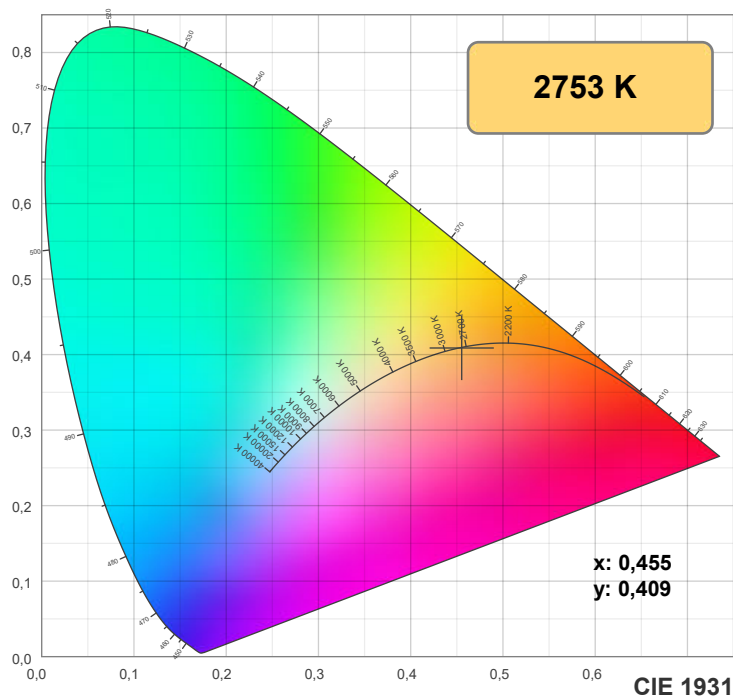
55411 Bingen am Rhein

#### Spectra

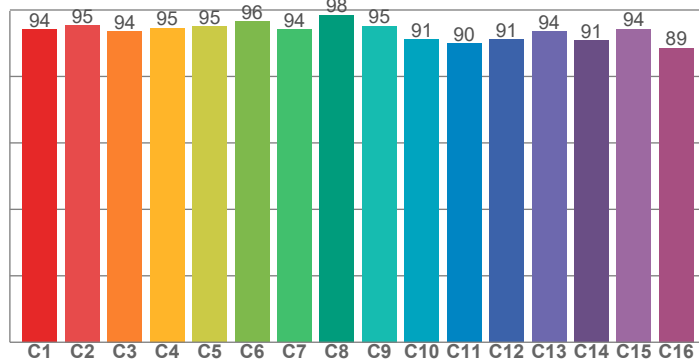


#### Power

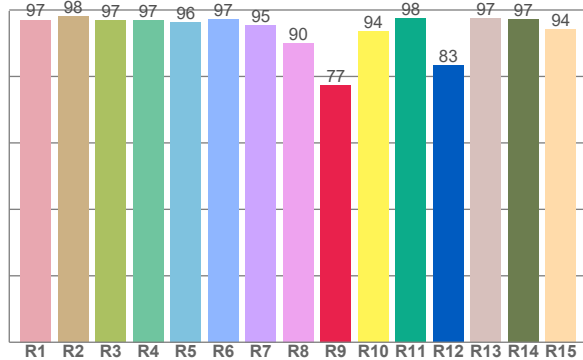
Voltage: 24,0 V  
Current: 0,190 A  
Frequency: 0 Hz



**TM30: 93,5**



**CRI: 96,0 (R1-R8)**



**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  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 97,1 | 98,0 | 96,8 | 97,0 | 96,3 | 97,1 | 95,4 | 90,1 | 77,4 | 93,5 | 97,5 | 83,3 | 97,5 | 97,1 | 94,3 |

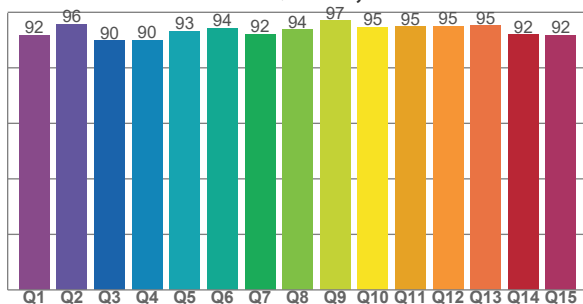
**TM30 C values, 16 binned values out of total of 99 C values**

| C1   | C2   | C3   | C4   | C5   | C6   | C7   | C8   | C9   | C10  | C11  | C12  | C13  | C14  | C15  | C16  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 94,1 | 95,4 | 93,6 | 94,6 | 95,0 | 96,5 | 94,2 | 98,5 | 95,2 | 91,2 | 90,0 | 91,1 | 93,5 | 90,8 | 94,2 | 88,5 |

**CQS Q values**

| Q1   | Q2   | Q3   | Q4   | Q5   | Q6   | Q7   | Q8   | Q9   | Q10  | Q11  | Q12  | Q13  | Q14  | Q15  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 91,8 | 95,7 | 89,8 | 89,9 | 93,2 | 94,3 | 92,2 | 93,8 | 97,0 | 94,7 | 94,8 | 95,1 | 95,2 | 91,9 | 91,8 |

**CQS: 93,0**



## Color parameters

| Color temperature | Color rendering index | Red component | Color fidelity | Color gamut | Color quality scale | Color coordinate cie 1931 | Color coordinate cie 1931 | Color coordinate | Color coordinate | Color deviation from black body |
|-------------------|-----------------------|---------------|----------------|-------------|---------------------|---------------------------|---------------------------|------------------|------------------|---------------------------------|
| CCT               | CRI                   | CRI R9        | TM30 Rf        | TM30 Rg     | CQS                 | x                         | y                         | u                | v                | Δuv                             |
| 2753 K            | 96,0                  | 77,4          | 93,5           | 100,1       | 93,0                | 0,455                     | 0,409                     | 0,260            | 0,351            | -0,0003                         |

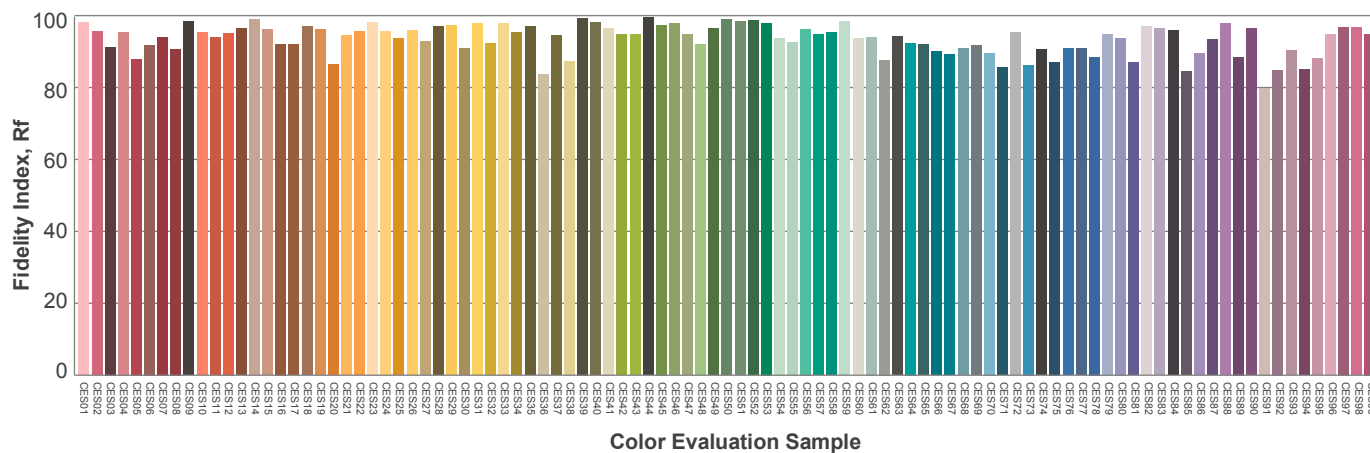
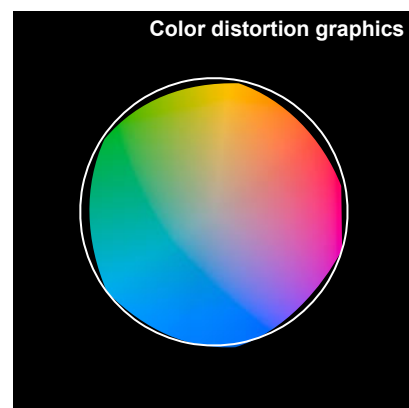
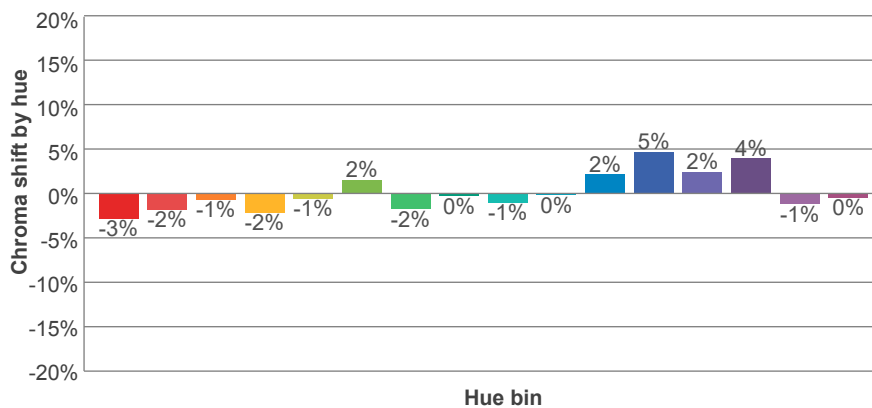
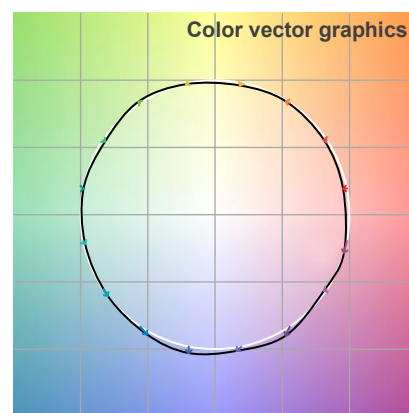
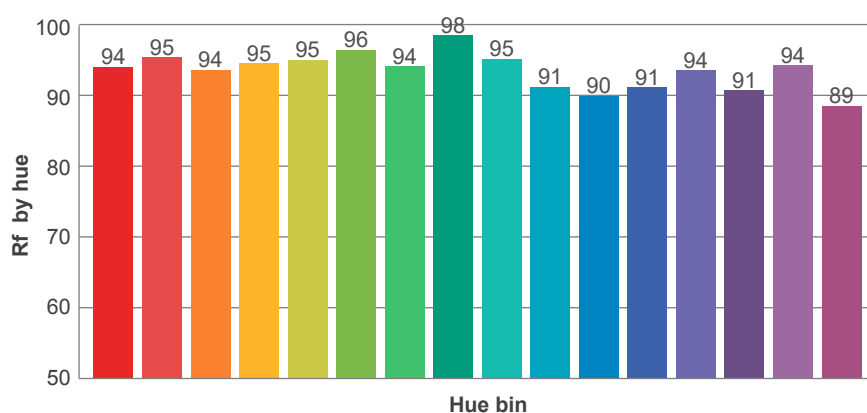
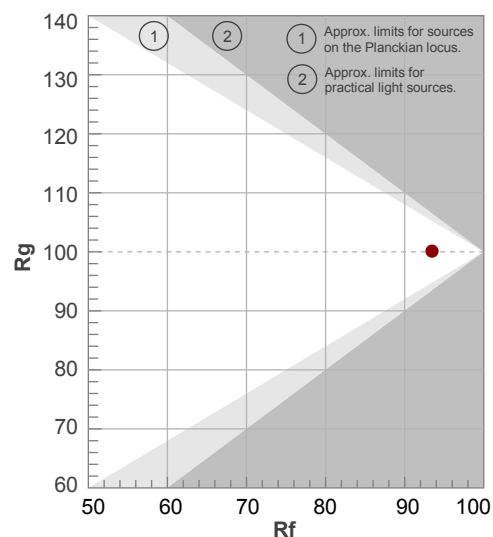
**Rf 93,5**

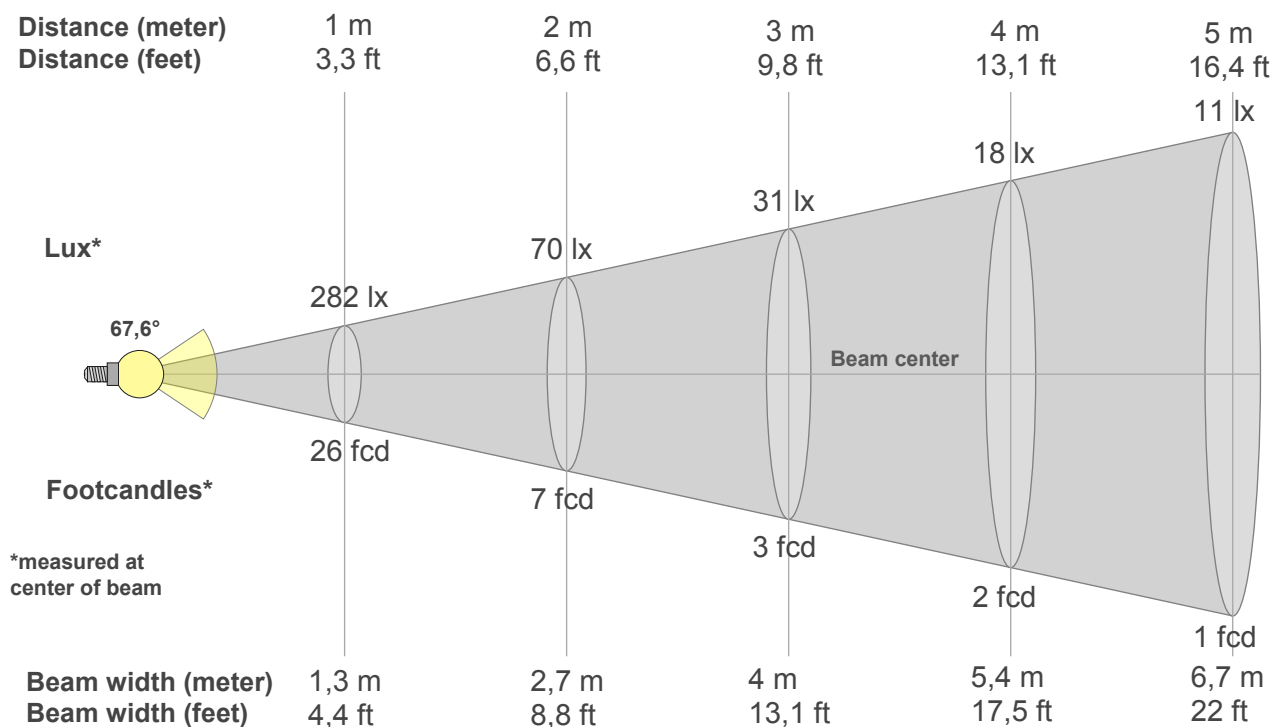
Fidelity index Rf

**Rg 100,1**

Gammut index Rg

| Hue Bin | R <sub>f</sub> | Graphic shifts (%) |     |
|---------|----------------|--------------------|-----|
|         |                | Chroma             | Hue |
| 1       | 94             | -3%                | 0%  |
| 2       | 95             | -2%                | 1%  |
| 3       | 94             | -1%                | 3%  |
| 4       | 95             | -2%                | 1%  |
| 5       | 95             | -1%                | 2%  |
| 6       | 96             | 2%                 | 1%  |
| 7       | 94             | -2%                | 0%  |
| 8       | 98             | 0%                 | 0%  |
| 9       | 95             | -1%                | 3%  |
| 10      | 91             | 0%                 | 6%  |
| 11      | 90             | 2%                 | 7%  |
| 12      | 91             | 5%                 | 1%  |
| 13      | 94             | 2%                 | -4% |
| 14      | 91             | 4%                 | -6% |
| 15      | 94             | -1%                | -2% |
| 16      | 89             | 0%                 | -9% |





## Beam intensities from 1-20m

| 1m      | 2m     | 3m     | 4m     | 5m     | 6m     | 7m     | 8m     | 9m     | 10m    | 11m    | 12m    | 13m    | 14m    | 15m    | 16m    | 17m    | 18m    | 19m    | 20m    |
|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 3,3ft   | 6,6ft  | 9,8ft  | 13,1ft | 16,4ft | 19,7ft | 23ft   | 26,2ft | 29,5ft | 32,8ft | 36,1ft | 39,4ft | 42,7ft | 45,9ft | 49,2ft | 52,5ft | 55,8ft | 59,1ft | 62,3ft | 65,6ft |
| 282lx   | 70lx   | 31lx   | 18lx   | 11lx   | 8lx    | 6lx    | 4lx    | 3lx    | 3lx    | 2lx    | 2lx    | 2lx    | 1lx    | 1lx    | 1lx    | 1lx    | 1lx    | 1lx    | 1lx    |
| 26,2fcd | 6,5fcd | 2,9fcd | 1,6fcd | 1fcd   | 0,7fcd | 0,5fcd | 0,4fcd | 0,3fcd | 0,3fcd | 0,2fcd | 0,2fcd | 0,2fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd |

## Intensities in 0° c-plane

| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 282  | 283  | 285  | 288  | 292  | 293  | 285  | 267 | 245 | 224 | 201 | 174 | 141 | 110 | 82  | 62  | 46  | 36  | 28  | 22  |
| 100% | 101% | 101% | 102% | 104% | 104% | 101% | 95% | 87% | 80% | 71% | 62% | 50% | 39% | 29% | 22% | 16% | 13% | 10% | 8%  |

## Intensities in 90° c-plane

| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14°  | 16°  | 18°  | 20°  | 22°  | 24°  | 26°  | 28°  | 30°  | 32°  | 34°  | 36°  | 38°  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 282  | 281  | 281  | 281  | 281  | 282  | 282  | 282  | 283  | 285  | 285  | 287  | 288  | 291  | 293  | 296  | 297  | 296  | 293  | 287  |
| 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 101% | 101% | 101% | 102% | 102% | 103% | 104% | 105% | 105% | 105% | 104% | 102% |

## Intensities in 180° c-plane

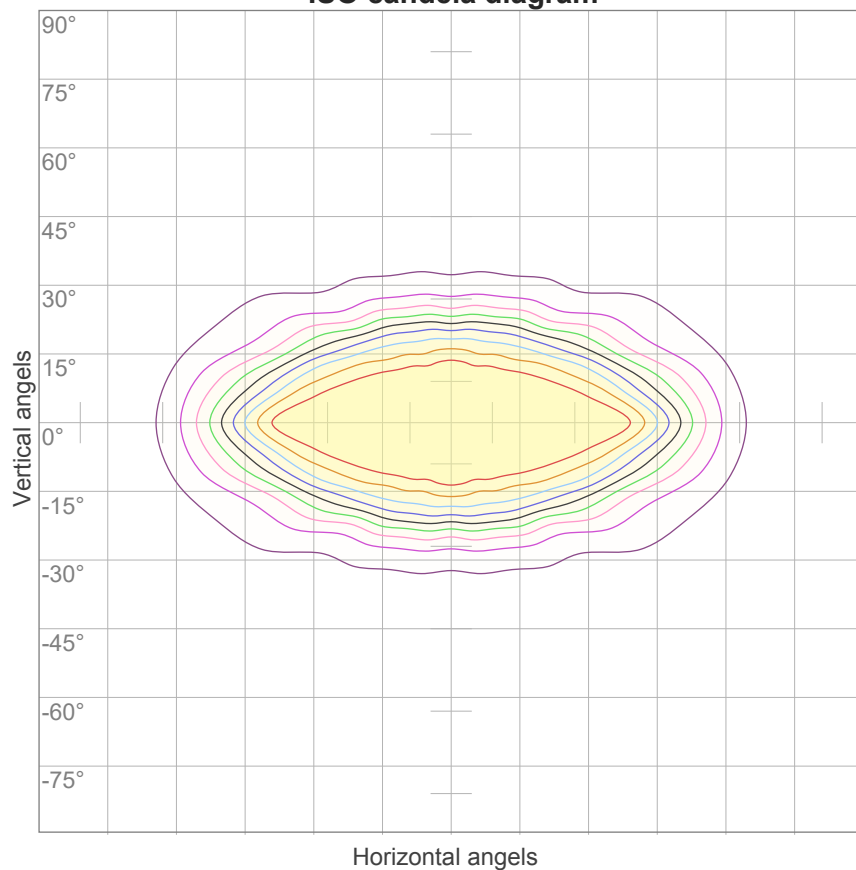
| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|------|------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 282  | 283  | 285  | 288  | 292  | 293  | 285  | 267 | 245 | 224 | 201 | 174 | 141 | 110 | 82  | 62  | 46  | 36  | 28  | 22  |
| 100% | 101% | 101% | 102% | 104% | 104% | 101% | 95% | 87% | 80% | 71% | 62% | 50% | 39% | 29% | 22% | 16% | 13% | 10% | 8%  |

## Intensities in 270° c-plane

| 0°   | 2°   | 4°   | 6°   | 8°   | 10°  | 12°  | 14°  | 16°  | 18°  | 20°  | 22°  | 24°  | 26°  | 28°  | 30°  | 32°  | 34°  | 36°  | 38°  |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| 282  | 281  | 281  | 281  | 281  | 282  | 282  | 282  | 283  | 285  | 285  | 287  | 288  | 291  | 293  | 296  | 297  | 296  | 293  | 287  |
| 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 101% | 101% | 101% | 102% | 102% | 103% | 104% | 105% | 105% | 105% | 104% | 102% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|----------------|-----------------|-------------------|------------------------------|-----------------------------|
| 67,6°          | 98,7°           | 142,9°            | 92,2%                        | 77,7%                       |

### ISO candela diagram



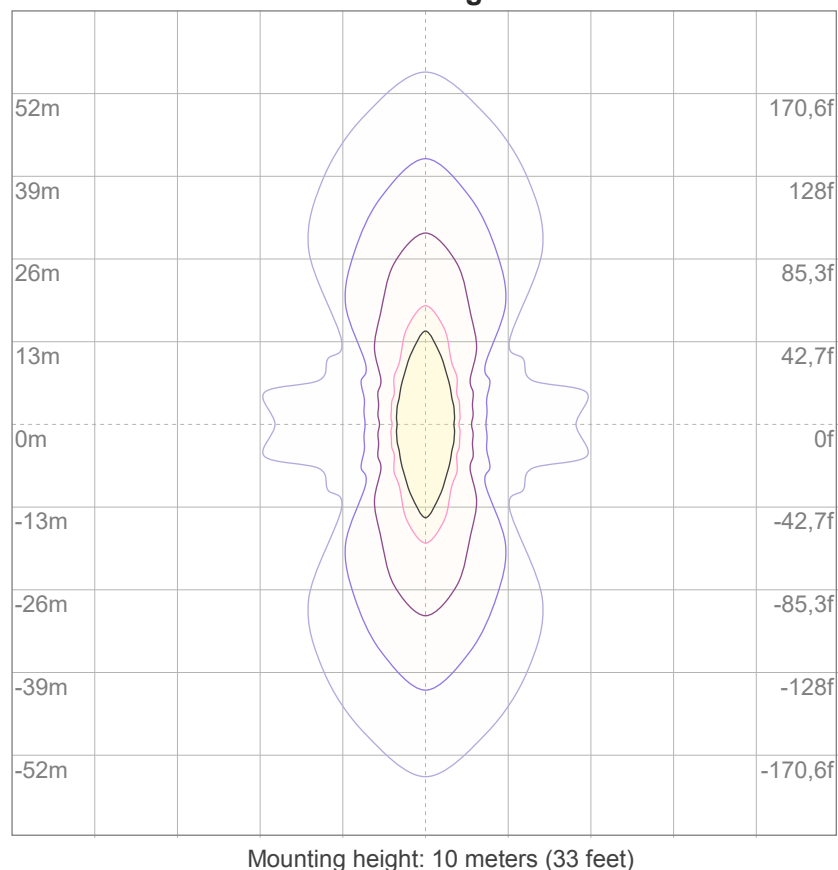
|     |        |
|-----|--------|
| 10% | 28 cd  |
| 20% | 56 cd  |
| 30% | 84 cd  |
| 40% | 113 cd |
| 50% | 141 cd |
| 60% | 169 cd |
| 70% | 197 cd |
| 80% | 225 cd |
| 90% | 253 cd |

#### Conditions:

Number of c-planes: 16

Candela at center: 282 cd

### ISO lux diagram



|     |          |
|-----|----------|
| 3%  | 84,5m lx |
| 5%  | 0,141 lx |
| 10% | 0,282 lx |
| 30% | 0,845 lx |
| 50% | 1,41 lx  |

#### Conditions:

Number of c-planes: 16

Lux at center: 2,82 lx

*Lux distribution on a surface  
when lamp is mounted at 10  
meters from the surface.*

### Glare Evaluation According to UGR

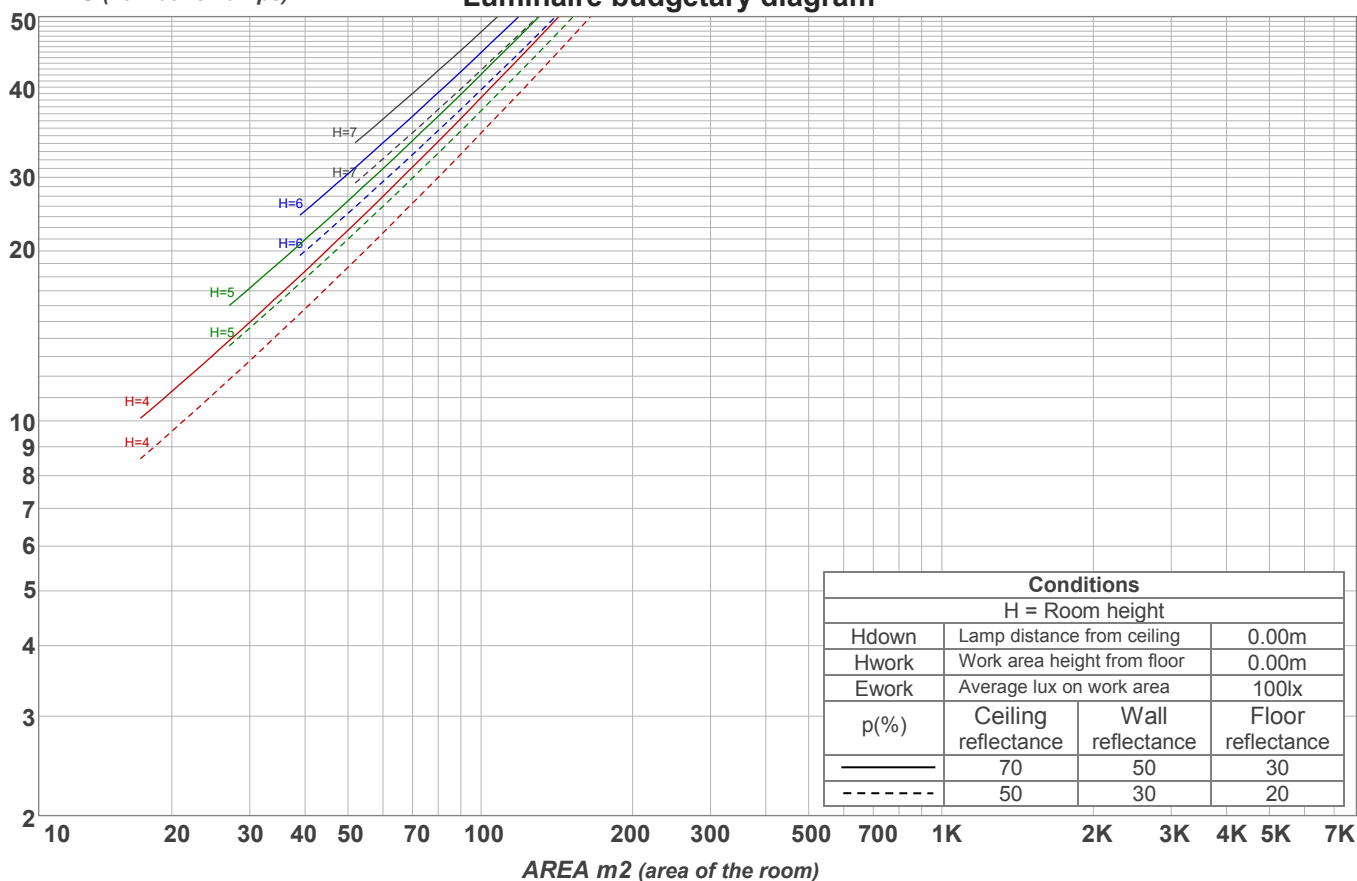
|   |     |   |      |      |      |      |   |      |      |      |      |
|---|-----|---|------|------|------|------|---|------|------|------|------|
| p Ceiling   |     | 70  | 70   | 50   | 50   | 30   | 70                                      | 70   | 50   | 50   | 30   |
| p Walls   |     | 50  | 30   | 50   | 30   | 30   | 50                                      | 30   | 50   | 30   | 30   |
| p Floor   |     | 20  | 20   | 20   | 20   | 20   | 20                                      | 20   | 20   | 20   | 20   |
| Room size<br>X      Y   |     | Viewing direction at right angles to<br>lamp axis |      |      |      |      | Viewing direction parallel to lamp axis |      |      |      |      |
| 2H  | 2H  | 10,7  | 11,6 | 10,9 | 11,9 | 12,1 | 24,1                                    | 25,0 | 24,3 | 25,3 | 25,5 |
|   | 3H  | 11,7  | 12,7 | 12,1 | 12,9 | 13,1 | 24,6                                    | 25,6 | 25,0 | 25,8 | 26,0 |
|   | 4H  | 12,2  | 13,1 | 12,6 | 13,4 | 13,6 | 24,8                                    | 25,7 | 25,2 | 26,0 | 26,2 |
|   | 6H  | 12,7  | 13,5 | 13,0 | 13,8 | 14,1 | 24,9                                    | 25,7 | 25,2 | 26,0 | 26,4 |
|   | 8H  | 12,9  | 13,6 | 13,2 | 14,0 | 14,4 | 24,9                                    | 25,7 | 25,3 | 26,0 | 26,4 |
|   | 12H | 13,0  | 13,8 | 13,4 | 14,1 | 14,6 | 24,9                                    | 25,7 | 25,3 | 26,0 | 26,4 |
| 4H  | 2H  | 11,8  | 12,7 | 12,2 | 13,0 | 13,2 | 23,8                                    | 24,7 | 24,2 | 25,0 | 25,2 |
|   | 3H  | 12,9  | 13,6 | 13,2 | 14,0 | 14,4 | 24,5                                    | 25,3 | 24,9 | 25,6 | 26,0 |
|   | 4H  | 13,3  | 14,0 | 13,8 | 14,5 | 15,0 | 24,7                                    | 25,3 | 25,1 | 25,8 | 26,3 |
|   | 6H  | 13,8  | 14,5 | 14,3 | 14,9 | 15,2 | 24,8                                    | 25,5 | 25,3 | 25,8 | 26,2 |
|   | 8H  | 14,1  | 14,7 | 14,6 | 15,1 | 15,4 | 24,8                                    | 25,4 | 25,3 | 25,8 | 26,2 |
|   | 12H | 14,3  | 14,8 | 14,8 | 15,2 | 15,7 | 24,8                                    | 25,3 | 25,3 | 25,7 | 26,2 |
| 8H  | 4H  | 13,8  | 14,4 | 14,3 | 14,7 | 15,1 | 24,5                                    | 25,2 | 25,1 | 25,5 | 25,9 |
|   | 6H  | 14,4  | 14,8 | 14,9 | 15,3 | 15,8 | 24,7                                    | 25,2 | 25,2 | 25,6 | 26,2 |
|   | 8H  | 14,7  | 15,1 | 15,2 | 15,6 | 16,2 | 24,8                                    | 25,2 | 25,3 | 25,7 | 26,3 |
|   | 12H | 15,1  | 15,4 | 15,6 | 15,9 | 16,5 | 24,8                                    | 25,1 | 25,4 | 25,6 | 26,2 |
| 12H   | 4H  | 13,8  | 14,3 | 14,3 | 14,7 | 15,2 | 24,5                                    | 25,0 | 25,0 | 25,4 | 25,9 |
|   | 6H  | 14,5  | 14,9 | 15,0 | 15,4 | 16,0 | 24,7                                    | 25,1 | 25,2 | 25,6 | 26,2 |
|   | 8H  | 14,8  | 15,2 | 15,4 | 15,7 | 16,3 | 24,7                                    | 25,1 | 25,3 | 25,6 | 26,2 |
| Variation of the observer position for the luminaire distance S |     |   |      |      |      |      |   |      |      |      |      |
| S = 1.0H  |     | 0,9 / -0,6  |      |      |      |      | 1,2 / -1,6                              |      |      |      |      |
| S = 1.5H  |     | 1,5 / -0,8  |      |      |      |      | 2,9 / -3,4                              |      |      |      |      |
| S = 2.0H  |     | 2,0 / -1,0  |      |      |      |      | 4,5 / -5,0                              |      |      |      |      |
| Standard table  |     | n/a   |      |      |      |      | n/a                                     |      |      |      |      |
| Correction<br>summand   |     | n/a   |      |      |      |      | n/a                                     |      |      |      |      |
| Corrected glare indices referring to 389 lm total luminous flux |     |   |      |      |      |      |   |      |      |      |      |

## 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 Lumens 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                   | 112  | 108 | 105 | 102 | 109 | 106 | 103 | 100 | 102 | 99  | 97  | 98  | 96  | 94  | 94  | 93  | 91  | 89  |
| 2                   | 104  | 98  | 93  | 88  | 102 | 96  | 91  | 87  | 93  | 89  | 85  | 90  | 86  | 83  | 87  | 84  | 82  | 80  |
| 3                   | 97   | 89  | 83  | 78  | 95  | 88  | 82  | 77  | 85  | 80  | 76  | 82  | 78  | 74  | 80  | 76  | 73  | 71  |
| 4                   | 91   | 81  | 74  | 69  | 89  | 80  | 74  | 69  | 78  | 72  | 68  | 76  | 71  | 67  | 74  | 70  | 66  | 64  |
| 5                   | 85   | 75  | 67  | 62  | 83  | 74  | 67  | 62  | 72  | 66  | 61  | 70  | 65  | 61  | 68  | 64  | 60  | 58  |
| 6                   | 80   | 69  | 62  | 56  | 78  | 68  | 61  | 56  | 66  | 60  | 56  | 65  | 59  | 55  | 63  | 59  | 55  | 53  |
| 7                   | 75   | 64  | 57  | 51  | 74  | 63  | 56  | 51  | 62  | 56  | 51  | 60  | 55  | 51  | 59  | 54  | 50  | 49  |
| 8                   | 71   | 59  | 52  | 47  | 69  | 59  | 52  | 47  | 58  | 51  | 47  | 56  | 51  | 47  | 55  | 50  | 47  | 45  |
| 9                   | 67   | 55  | 48  | 44  | 66  | 55  | 48  | 44  | 54  | 48  | 43  | 53  | 47  | 43  | 52  | 47  | 43  | 42  |
| 10                  | 63   | 52  | 45  | 41  | 62  | 51  | 45  | 41  | 51  | 45  | 40  | 50  | 44  | 40  | 49  | 44  | 40  | 39  |

LAMPS (number of lamps)

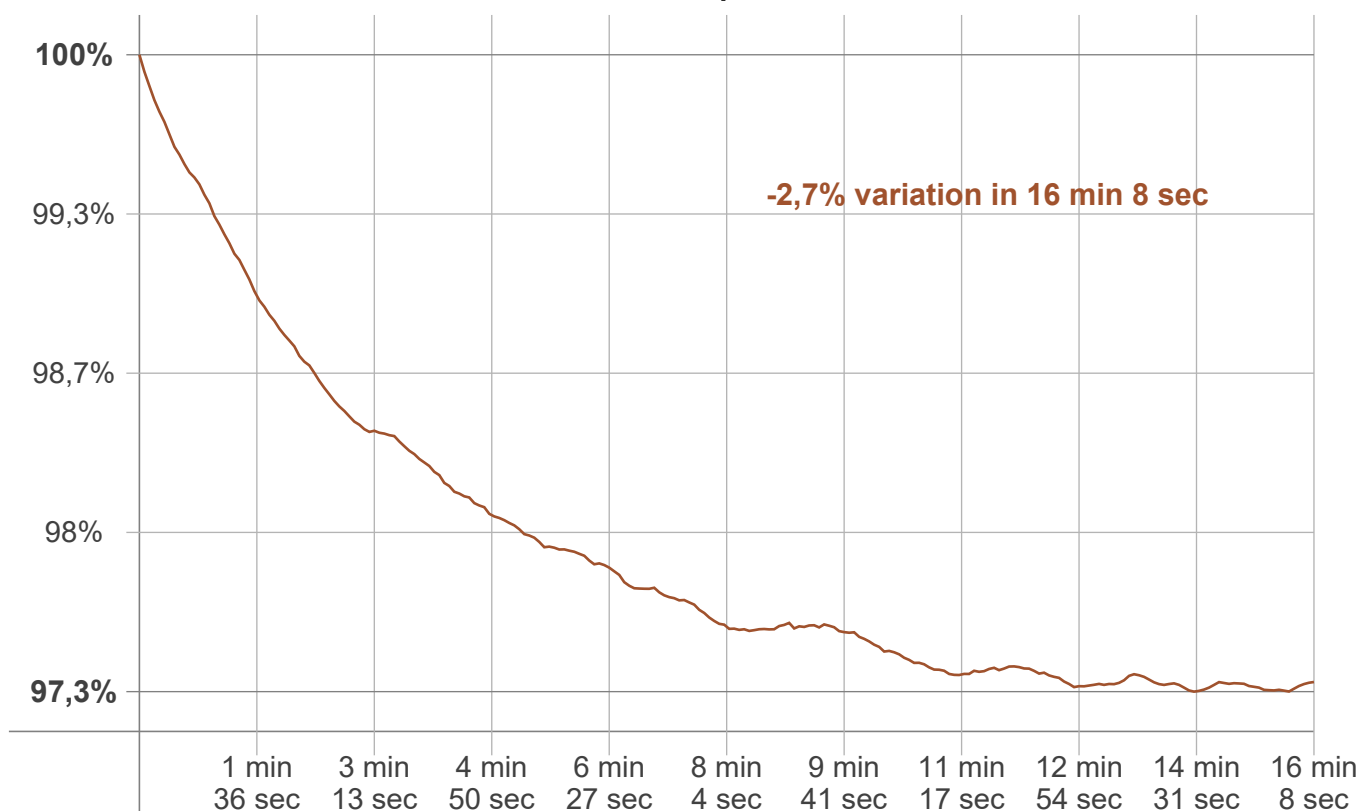
## Luminaire budgetary diagram



## Zonal Lumen Summary

| 0°-10°   | 10°-20°   | 20°-30°   | 30°-40°   | 40°-50°   | 50°-60°   | 60°-70°   | 70°-80°   | 80°-90°   |
|----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 27,3 lm  | 76,0 lm   | 93,4 lm   | 76,5 lm   | 52,5 lm   | 32,9 lm   | 18,3 lm   | 8,43 lm   | 3,61 lm   |
| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
| 0,008 lm | 0,000 lm  | 0,000 lm  | 0,000 lm  | 0,000 lm  | 0,000 lm  | 0,000 lm  | 0,000 lm  | 0,000 lm  |

## Warmup curve



## Warmup result

|                  |                                 |
|------------------|---------------------------------|
| Warmup time:     | Lamp stabilized in 16 min 8 sec |
| Warmup variation | -2,7%                           |

## Warmup conditions

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

## Color temperature change

| CCT start | CCT change | CCT end |
|-----------|------------|---------|
| 2758 K    | -5 K       | 2753 K  |

## Output change

| Output start | Output change | Output end |
|--------------|---------------|------------|
| 398 lm       | -10 lm        | 389 lm     |