**Light efficiency:**

148 Lumen/Watt

**Light quality:**

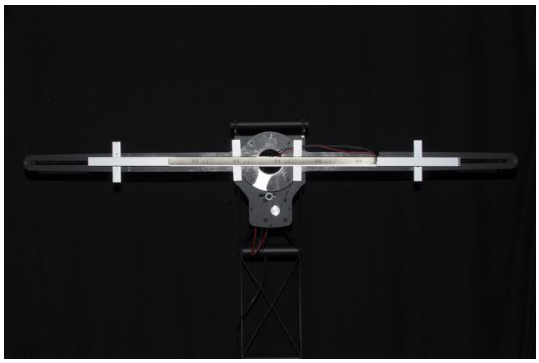
CRI: 82,0

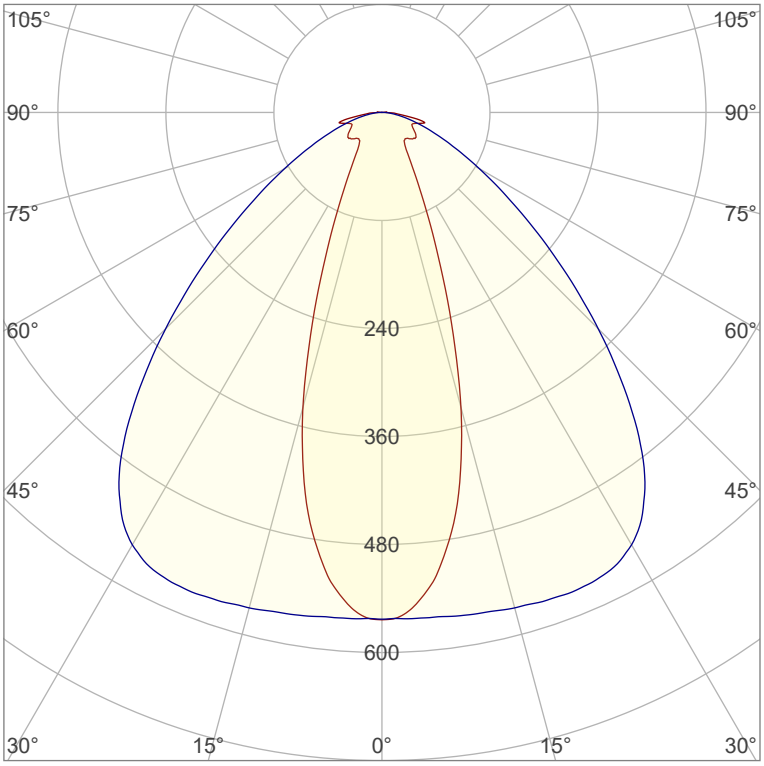
**Color temperature:**

2700 K

**Output:** 639 lm
**Peak:** 573 cd

**Power:** 4,3 W
**PF:** 1,0






**Product name:**
**Navigator-3_510mm_827_Lens-30°-Frosted**

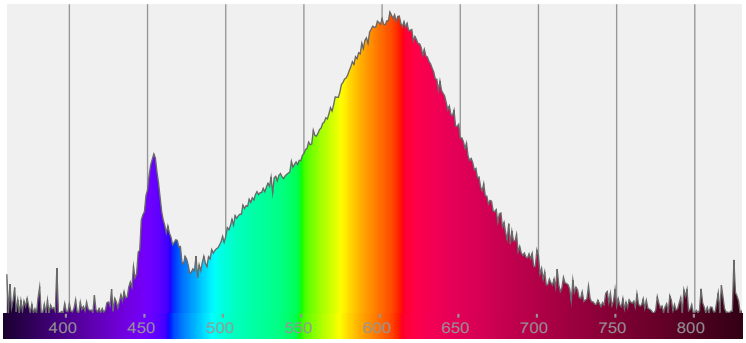
**Item number:**
**NP/L1C/14C/0510/827/L3F**

**Date and time:**
**21.06.2022 14:31:07**

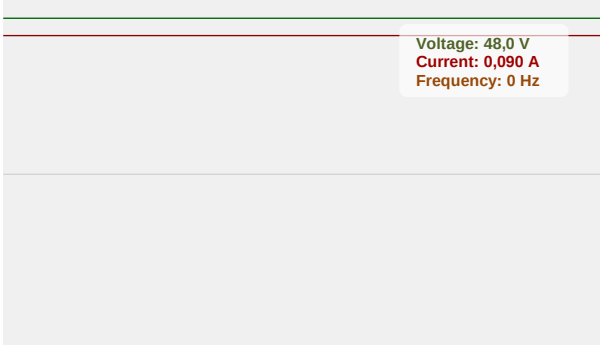
**Description:**
**Tolerances:**
**Lumen +/-4%**
**Candela +/-2,5%**
**Colour Temp +/-35 Kelvin**
**CRI +/-0,7**
**Angular Resolution: 1 Degree Step**
**Last Calibration 20-09-2021**
**Tester: Peter Ulrich**
**Test Site: Lichtlabor**
**Gaustrasse 13**
**55411 Bingen am Rhein**

**CIE 1931**
**x: 0,460**
**y: 0,411**

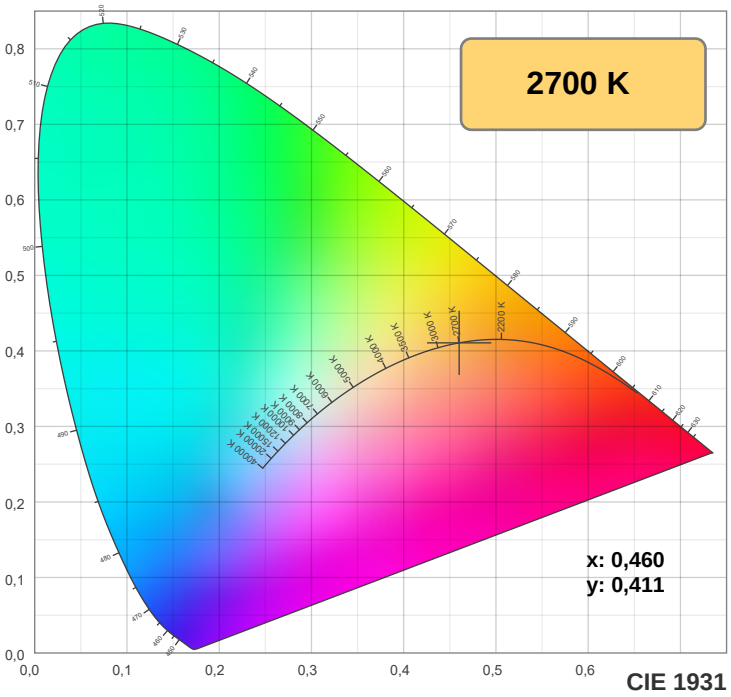
**Spectra**



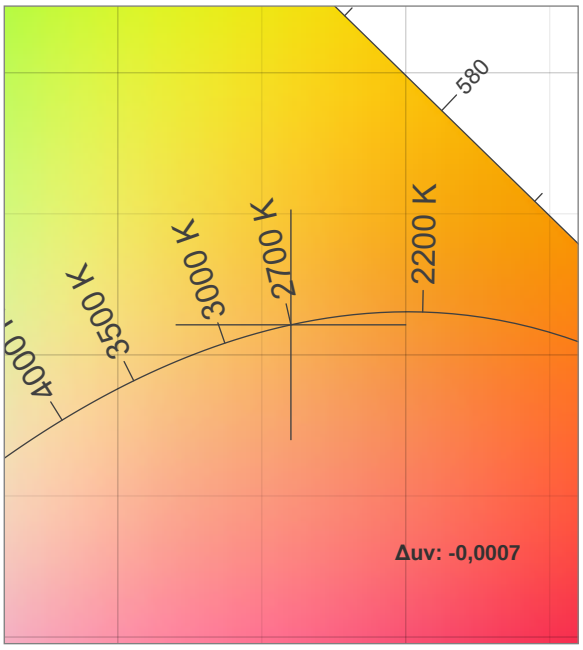

**Power**



# Color details

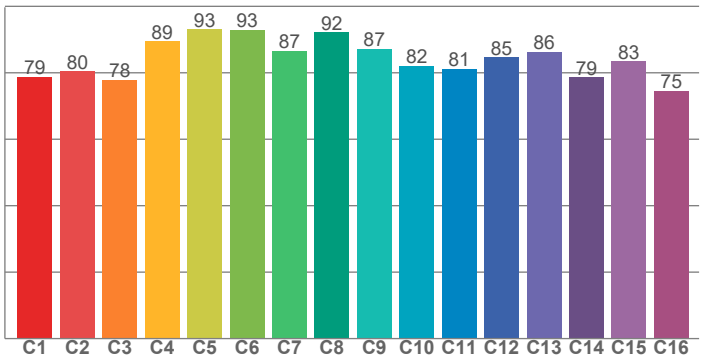



CIE 1931

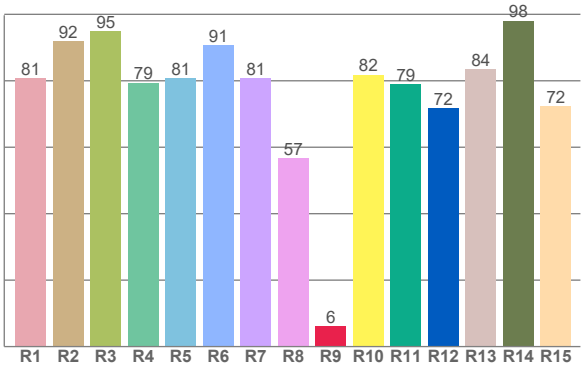



CIE 1931 ZOOM

## TM30: 84,1




## CRI: 82,0 (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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 80,8 | 91,9 | 95,0 | 79,4 | 80,8 | 90,7 | 80,8 | 56,6 | 6,0 | 81,8 | 79,0 | 71,8 | 83,5 | 98,1 | 72,4 |

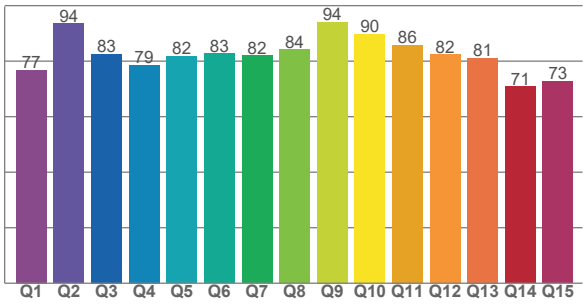
**TM30 C values, 16 binned values out of total of 99 C values**

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 78,8 | 80,4 | 77,9 | 89,4 | 93,1 | 93,0 | 86,6 | 92,2 | 87,2 | 82,1 | 81,3 | 84,6 | 86,4 | 78,6 | 83,5 | 74,6 |

**CQS Q values**

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 76,8 | 93,6 | 82,6 | 78,6 | 81,7 | 82,7 | 82,0 | 84,2 | 94,1 | 89,7 | 85,8 | 82,4 | 81,2 | 70,9 | 72,7 |

## CQS: 81,3




## 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 diviation from black body |
|---|---|---|---|---|---|---|---|---|---|---|
| CCT | CRI | CRI R9 | TM30 Rf | TM30 Rg | CQS | x | y | u | v | Δuv |
| 2700 K | 82,0 | 6,0 | 84,1 | 95,3 | 81,3 | 0,460 | 0,411 | 0,263 | 0,352 | -0,0007 |

# TM30 details

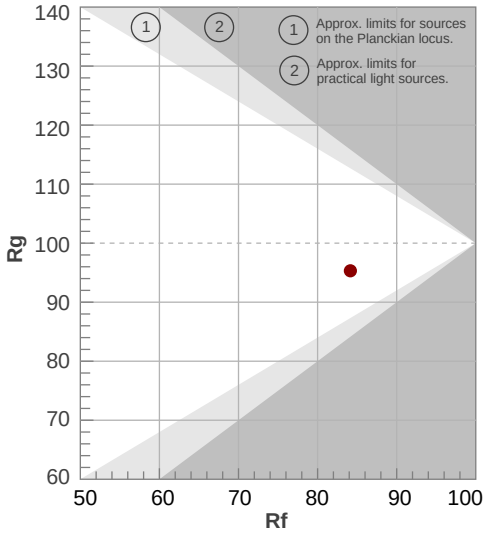
**Rf 84,1**

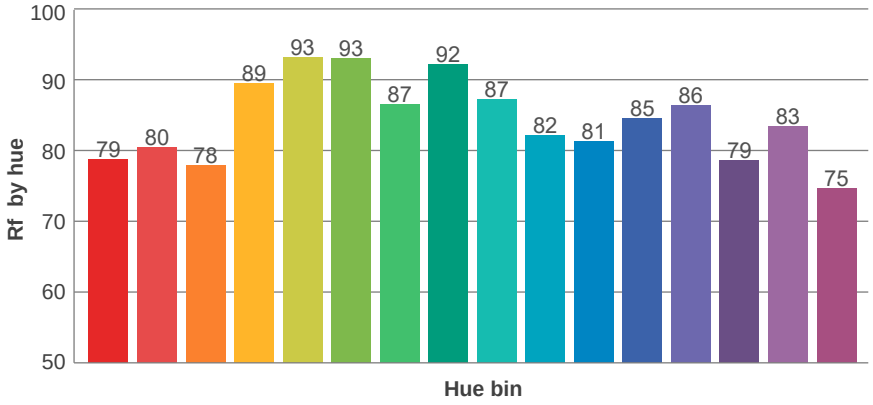
Fidelity index Rf

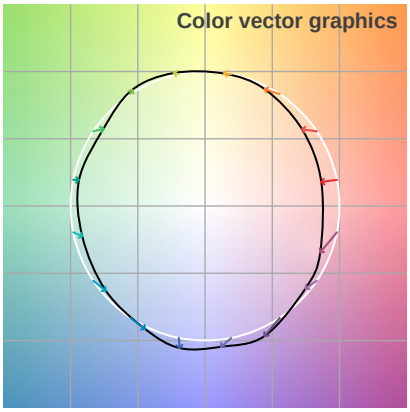
**Rg 95,3**

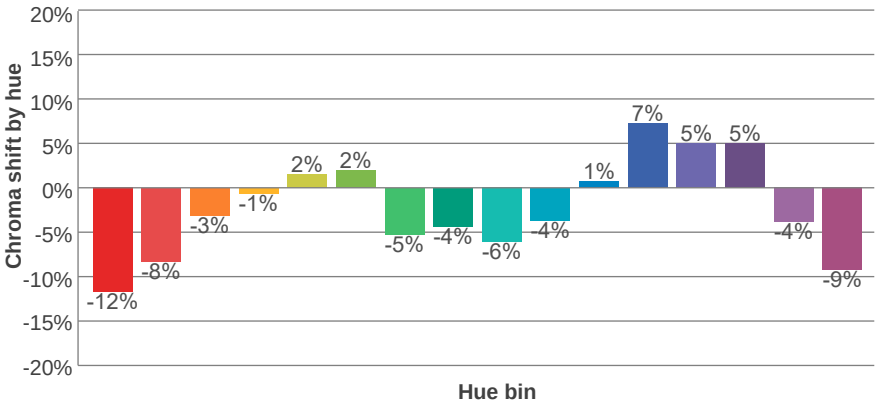
Gammut index Rg

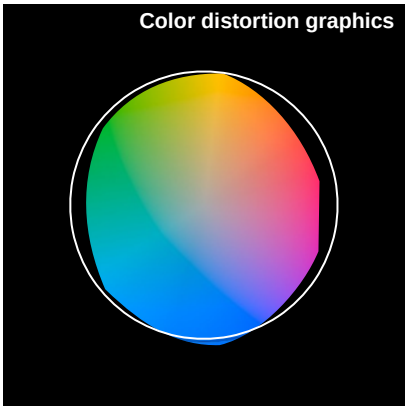
| | | Graphic shifts (%) | |
|---|---|---|---|
| Hue Bin | $R_f$ | Chroma | Hue |
| 1 | 79 | -12% | 1% |
| 2 | 80 | -8% | 7% |
| 3 | 78 | -3% | 11% |
| 4 | 89 | -1% | 5% |
| 5 | 93 | 2% | 4% |
| 6 | 93 | 2% | -3% |
| 7 | 87 | -5% | -6% |
| 8 | 92 | -4% | -1% |
| 9 | 87 | -6% | 4% |
| 10 | 82 | -4% | 11% |
| 11 | 81 | 1% | 14% |
| 12 | 85 | 7% | 2% |
| 13 | 86 | 5% | -9% |
| 14 | 79 | 5% | -17% |
| 15 | 83 | -4% | -9% |
| 16 | 75 | -9% | -17% |

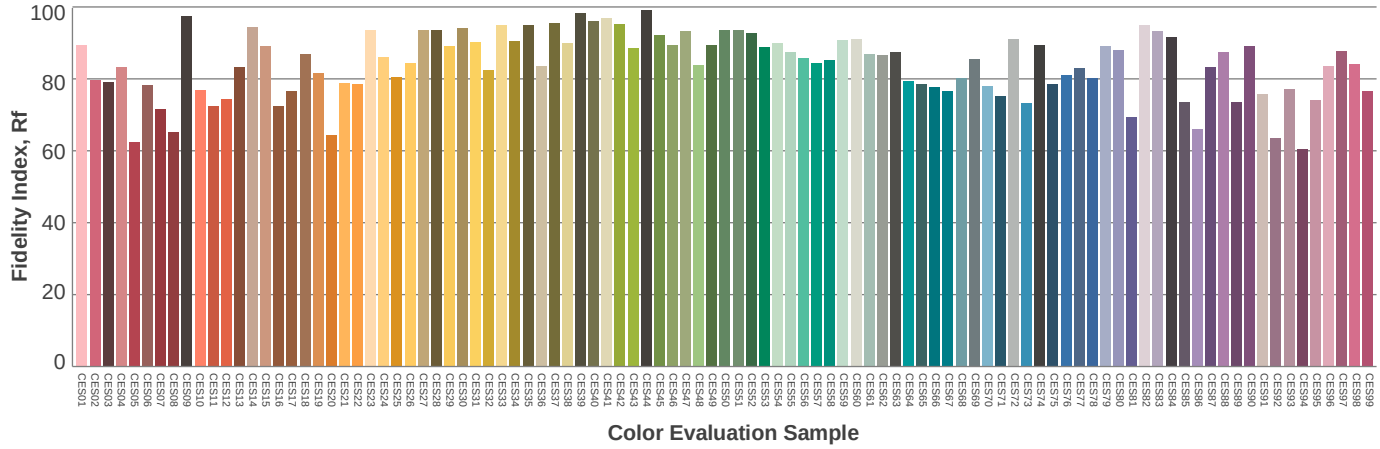


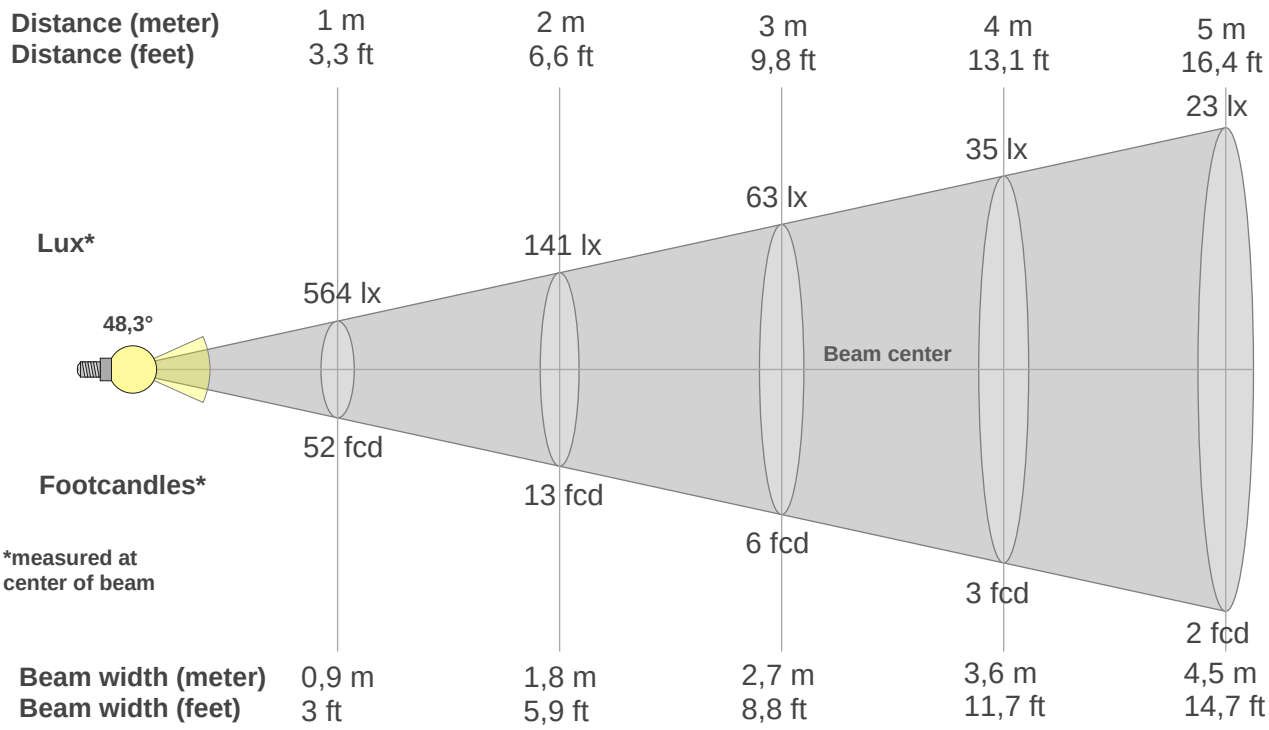



# Beam details




**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 |
| 564lx | 141lx | 63lx | 35lx | 23lx | 16lx | 12lx | 9lx | 7lx | 6lx | 5lx | 4lx | 3lx | 3lx | 3lx | 2lx | 2lx | 2lx | 2lx | 1lx |
| 52,4fcd | 13,1fcd | 5,8fcd | 3,3fcd | 2,1fcd | 1,5fcd | 1,1fcd | 0,8fcd | 0,6fcd | 0,5fcd | 0,4fcd | 0,4fcd | 0,3fcd | 0,3fcd | 0,2fcd | 0,2fcd | 0,2fcd | 0,2fcd | 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° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 564 | 560 | 547 | 527 | 497 | 461 | 417 | 366 | 310 | 254 | 203 | 159 | 125 | 98 | 79 | 64 | 54 | 47 | 43 | 40 |
| 100% | 99% | 97% | 93% | 88% | 82% | 74% | 65% | 55% | 45% | 36% | 28% | 22% | 17% | 14% | 11% | 10% | 8% | 8% | 7% |

**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° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 564 | 563 | 563 | 564 | 565 | 566 | 567 | 569 | 570 | 572 | 572 | 573 | 572 | 569 | 564 | 555 | 541 | 520 | 496 | 466 |
| 100% | 100% | 100% | 100% | 100% | 100% | 101% | 101% | 101% | 101% | 101% | 102% | 101% | 101% | 100% | 98% | 96% | 92% | 88% | 83% |

**Intensities in 180° c-plane**

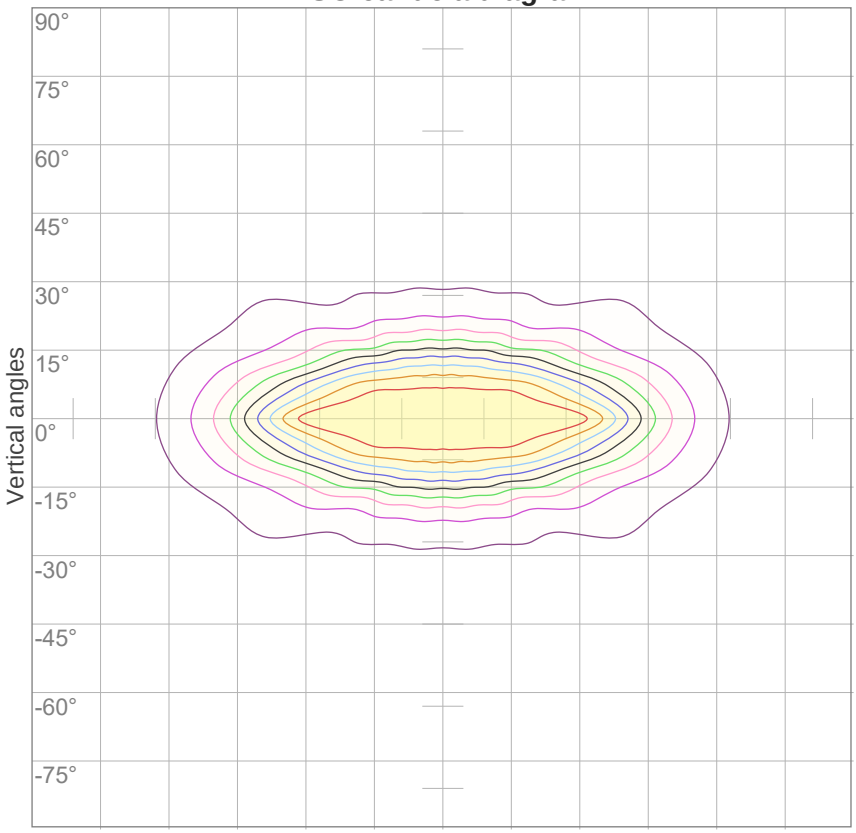
| 0° | 2° | 4° | 6° | 8° | 10° | 12° | 14° | 16° | 18° | 20° | 22° | 24° | 26° | 28° | 30° | 32° | 34° | 36° | 38° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 564 | 560 | 547 | 527 | 497 | 461 | 417 | 366 | 310 | 254 | 203 | 159 | 125 | 98 | 79 | 64 | 54 | 47 | 43 | 40 |
| 100% | 99% | 97% | 93% | 88% | 82% | 74% | 65% | 55% | 45% | 36% | 28% | 22% | 17% | 14% | 11% | 10% | 8% | 8% | 7% |

**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° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 564 | 563 | 563 | 564 | 565 | 566 | 567 | 569 | 570 | 572 | 572 | 573 | 572 | 569 | 564 | 555 | 541 | 520 | 496 | 466 |
| 100% | 100% | 100% | 100% | 100% | 100% | 101% | 101% | 101% | 101% | 101% | 102% | 101% | 101% | 100% | 98% | 96% | 92% | 88% | 83% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|---|---|---|---|---|
| **48,3°** | **81,9°** | **172,7°** | **83,2%** | **68,7%** |

## ISO candela diagram



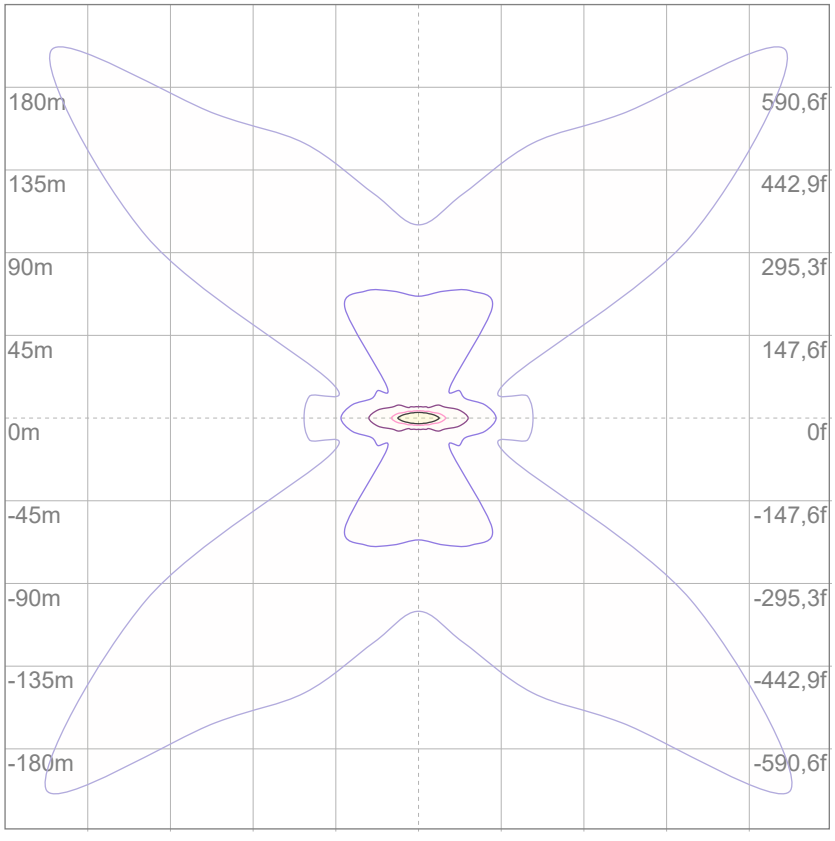

| | |
|---|---|
| 10% | 56 cd |
| 20% | 113 cd |
| 30% | 169 cd |
| 40% | 226 cd |
| 50% | 282 cd |
| 60% | 339 cd |
| 70% | 395 cd |
| 80% | 451 cd |
| 90% | 508 cd |

Conditions:

Number of c-planes: 16

Candela at center: 564 cd

## ISO lux diagram




Mounting height: 10 meters (33 feet)

| | |
|---|---|
| 3% | 0,169 lx |
| 5% | 0,282 lx |
| 10% | 0,564 lx |
| 30% | 1,69 lx |
| 50% | 2,82 lx |

Conditions:

Number of c-planes: 16

Lux at center: 5,64 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 X | Y | Viewing direction at right angles to lamp axis | | | | | Viewing direction parallel to lamp axis | | | | |
| 2H | 2H | 14,0 | 15,0 | 14,2 | 15,2 | 15,4 | 22,1 | 23,0 | 22,3 | 23,3 | 23,5 |
| | 3H | 16,1 | 17,2 | 16,5 | 17,4 | 17,6 | 22,8 | 23,9 | 23,2 | 24,1 | 24,3 |
| | 4H | 17,8 | 18,9 | 18,2 | 19,1 | 19,4 | 23,2 | 24,2 | 23,6 | 24,4 | 24,7 |
| | 6H | 19,6 | 20,5 | 19,9 | 20,8 | 21,1 | 23,5 | 24,4 | 23,8 | 24,7 | 25,0 |
| | 8H | 20,0 | 20,8 | 20,3 | 21,1 | 21,5 | 23,6 | 24,4 | 23,9 | 24,7 | 25,2 |
| | 12H | 20,1 | 21,0 | 20,5 | 21,3 | 21,8 | 23,6 | 24,5 | 24,0 | 24,8 | 25,2 |
| 4H | 2H | 14,8 | 15,8 | 15,2 | 16,0 | 16,3 | 21,8 | 22,8 | 22,2 | 23,1 | 23,4 |
| | 3H | 17,2 | 18,0 | 17,6 | 18,4 | 18,8 | 22,8 | 23,7 | 23,2 | 24,0 | 24,5 |
| | 4H | 19,0 | 19,8 | 19,5 | 20,2 | 20,7 | 23,2 | 24,0 | 23,6 | 24,4 | 24,9 |
| | 6H | 20,9 | 21,7 | 21,4 | 22,0 | 22,4 | 23,5 | 24,3 | 24,0 | 24,7 | 25,0 |
| | 8H | 21,4 | 22,1 | 21,9 | 22,4 | 22,8 | 23,7 | 24,4 | 24,2 | 24,8 | 25,1 |
| | 12H | 21,6 | 22,2 | 22,1 | 22,6 | 23,1 | 23,8 | 24,4 | 24,3 | 24,8 | 25,3 |
| 8H | 4H | 19,4 | 20,2 | 20,0 | 20,5 | 20,9 | 23,2 | 23,9 | 23,7 | 24,3 | 24,7 |
| | 6H | 21,6 | 22,1 | 22,1 | 22,6 | 23,1 | 23,7 | 24,2 | 24,2 | 24,7 | 25,2 |
| | 8H | 22,2 | 22,7 | 22,7 | 23,2 | 23,8 | 23,9 | 24,4 | 24,5 | 24,9 | 25,6 |
| | 12H | 22,6 | 22,9 | 23,1 | 23,4 | 24,1 | 24,1 | 24,5 | 24,7 | 25,0 | 25,6 |
| 12H | 4H | 19,5 | 20,1 | 20,0 | 20,5 | 21,0 | 23,2 | 23,8 | 23,7 | 24,2 | 24,7 |
| | 6H | 21,8 | 22,2 | 22,3 | 22,7 | 23,4 | 23,8 | 24,3 | 24,3 | 24,8 | 25,4 |
| | 8H | 22,4 | 22,8 | 23,0 | 23,3 | 23,9 | 24,1 | 24,4 | 24,6 | 24,9 | 25,6 |

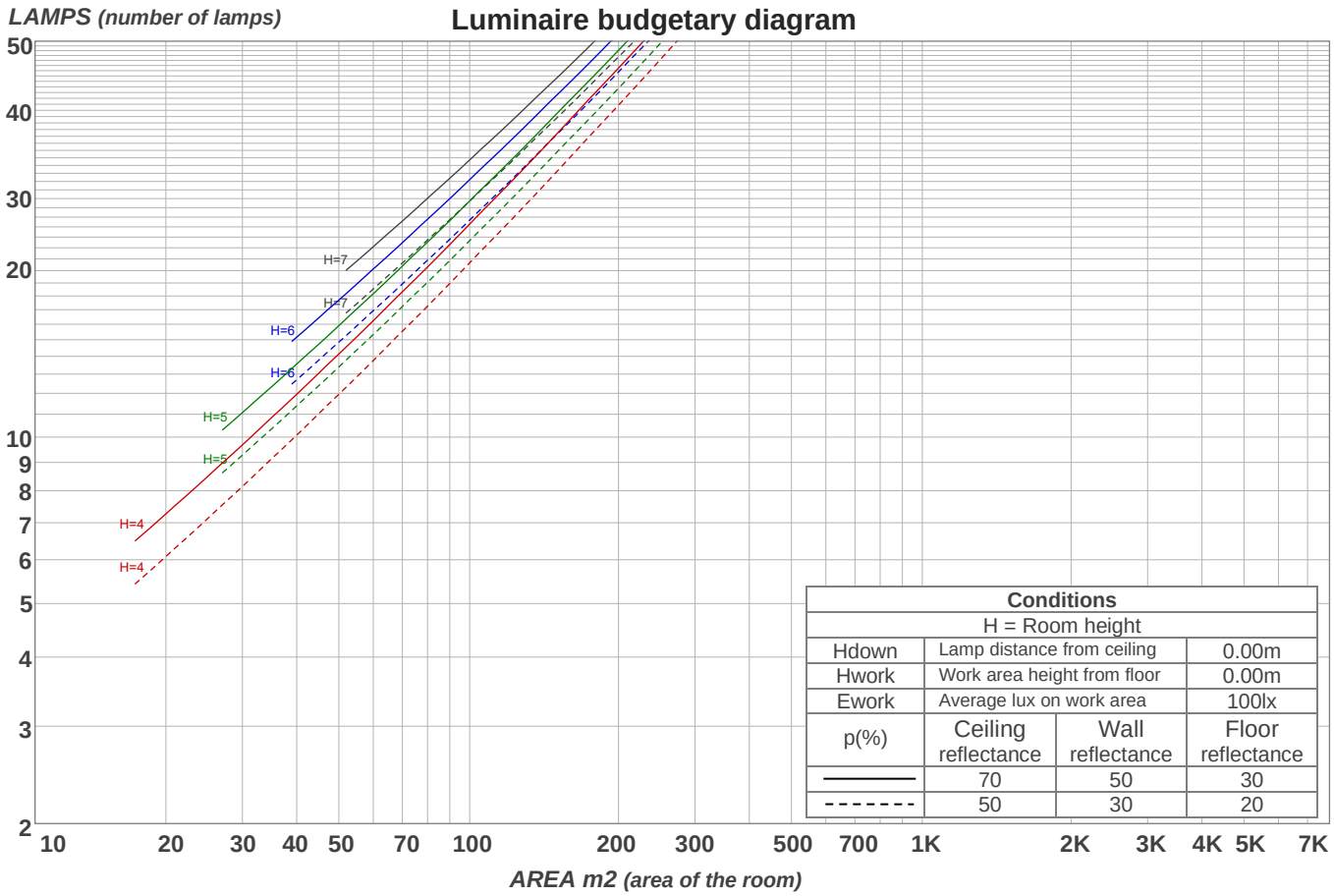
| Variation of the observer position for the luminaire distance S | | |
|---|---|---|
| S = 1.0H | 0,1 / 0,0 | 1,0 / -0,9 |
| S = 1.5H | 0,1 / -0,1 | 2,3 / -1,8 |
| S = 2.0H | 0,2 / -0,1 | 3,5 / -2,5 |
| Standard table | n/a | n/a |
| Correction summand | n/a | n/a |

Corrected glare indices referring to 639 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 | 118 | 118 | 118 | 118 | 115 | 115 | 115 | 115 | 110 | 110 | 110 | 105 | 105 | 105 | 100 | 100 | 100 | 98 |
| 1 | 109 | 105 | 101 | 98 | 107 | 103 | 99 | 96 | 98 | 95 | 93 | 94 | 92 | 90 | 90 | 88 | 86 | 84 |
| 2 | 101 | 94 | 88 | 84 | 99 | 92 | 87 | 82 | 88 | 84 | 80 | 85 | 81 | 78 | 82 | 79 | 76 | 74 |
| 3 | 94 | 85 | 78 | 73 | 92 | 84 | 77 | 72 | 80 | 75 | 70 | 77 | 73 | 69 | 75 | 71 | 68 | 66 |
| 4 | 88 | 78 | 70 | 64 | 86 | 76 | 69 | 64 | 74 | 68 | 63 | 71 | 66 | 62 | 69 | 64 | 61 | 59 |
| 5 | 82 | 71 | 64 | 58 | 80 | 70 | 63 | 57 | 68 | 61 | 57 | 66 | 60 | 56 | 64 | 59 | 55 | 53 |
| 6 | 77 | 66 | 58 | 53 | 75 | 65 | 57 | 52 | 63 | 56 | 52 | 61 | 55 | 51 | 59 | 54 | 50 | 49 |
| 7 | 73 | 61 | 53 | 48 | 71 | 60 | 53 | 48 | 58 | 52 | 47 | 57 | 51 | 47 | 55 | 50 | 46 | 45 |
| 8 | 68 | 57 | 49 | 44 | 67 | 56 | 49 | 44 | 55 | 48 | 44 | 53 | 48 | 43 | 52 | 47 | 43 | 41 |
| 9 | 65 | 53 | 46 | 41 | 63 | 52 | 46 | 41 | 51 | 45 | 41 | 50 | 44 | 40 | 49 | 44 | 40 | 38 |
| 10 | 61 | 50 | 43 | 38 | 60 | 49 | 43 | 38 | 48 | 42 | 38 | 47 | 42 | 38 | 46 | 41 | 37 | 36 |

## Luminaire budgetary diagram

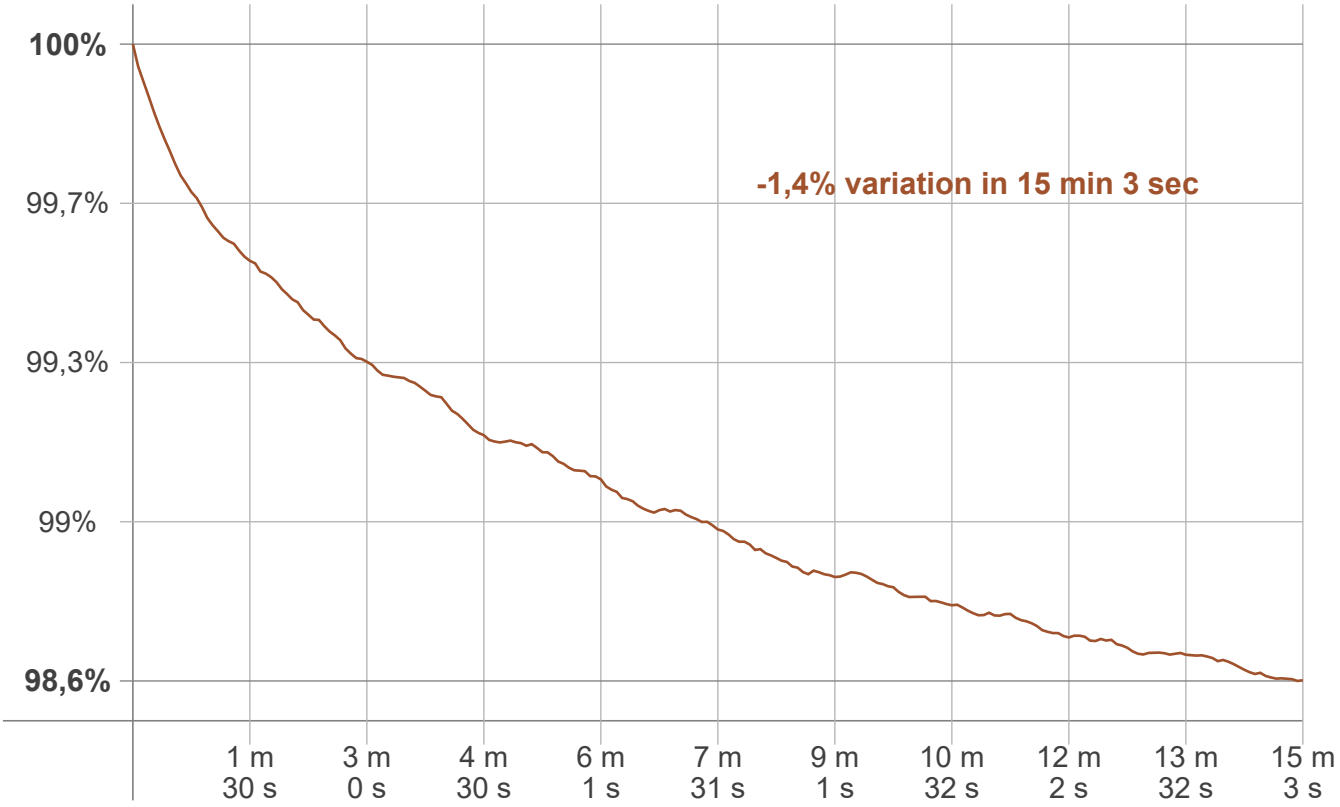



## Zonal Lumen Summary

| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|---|---|---|---|---|---|---|---|---|
| 49,8 lm | 121 lm | 125 lm | 103 lm | 75,0 lm | 57,4 lm | 41,1 lm | 32,9 lm | 18,0 lm |

| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
|---|---|---|---|---|---|---|---|---|
| 6,31 lm | 1,28 lm | 1,19 lm | 1,07 lm | 0,927 lm | 0,752 lm | 0,554 lm | 0,339 lm | 2,84 lm |

## Warmup curve




## Warmup result

| | |
|---|---|
| **Warmup time:** | **Lamp stabilized in 15 min 3 sec** |
| **Warmup variation** | **-1,4%** |

## Warmup conditions

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

## Color temperature change

| CCT start | CCT change | CCT end |
|---|---|---|
| 2698 K | +2 K | 2700 K |

## Output change

| Output start | Output change | Output end |
|---|---|---|
| 649 lm | -10 lm | 639 lm |