**Light efficiency:**

23 Lumen/Watt

**Light quality:**

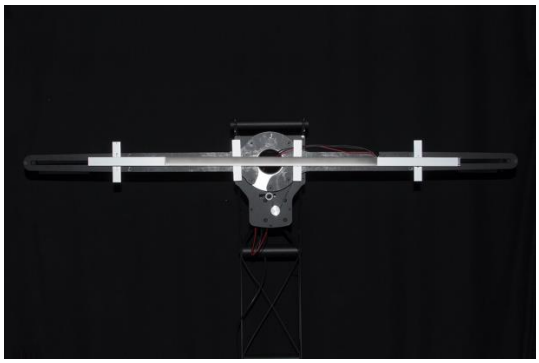
CRI: 35,5

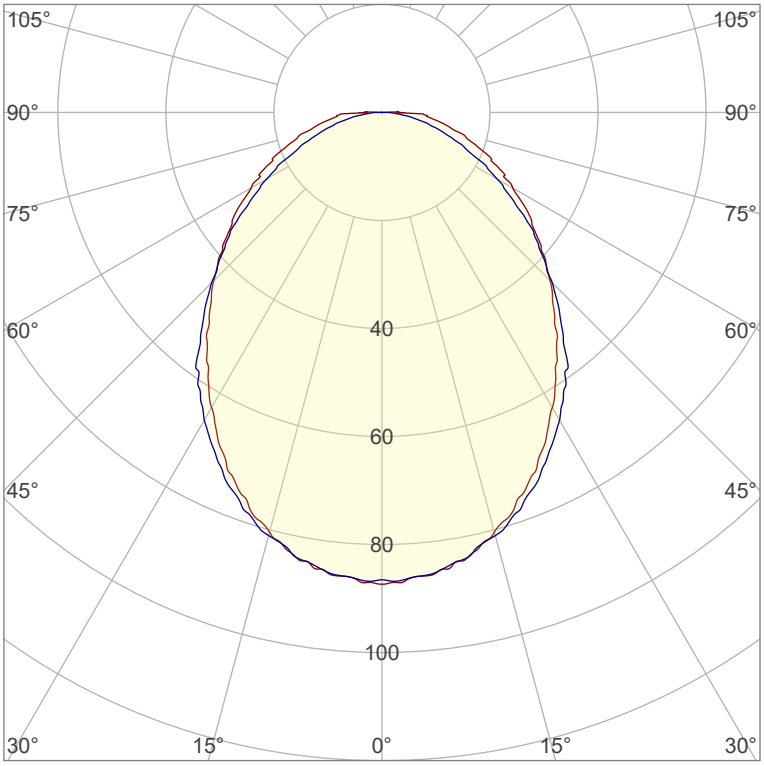
**Color temperature:**

11032 K

**Output:** 210 lm
**Peak:** 87,3 cd

**Power:** 9,1 W
**PF:** 1,0






CIE 1931
x: 0,271
y: 0,290

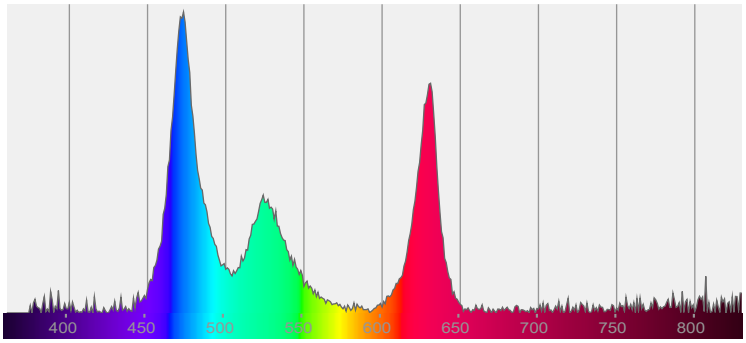
**Product name:**
**Defiant-3_510mm_RGB_Cover-Square-Grey**

**Item number:**
**NP/L3C/22C/0510/RGB/CSG**

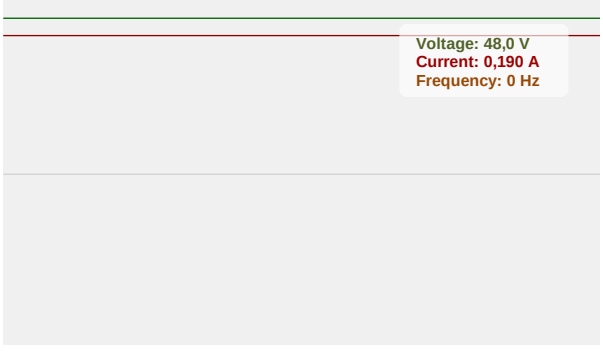
**Date and time:**
**01.07.2020 08:46:00**

**Description:**
**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**
**Gaustrasse 13**
**55411 Bingen am Rhein**

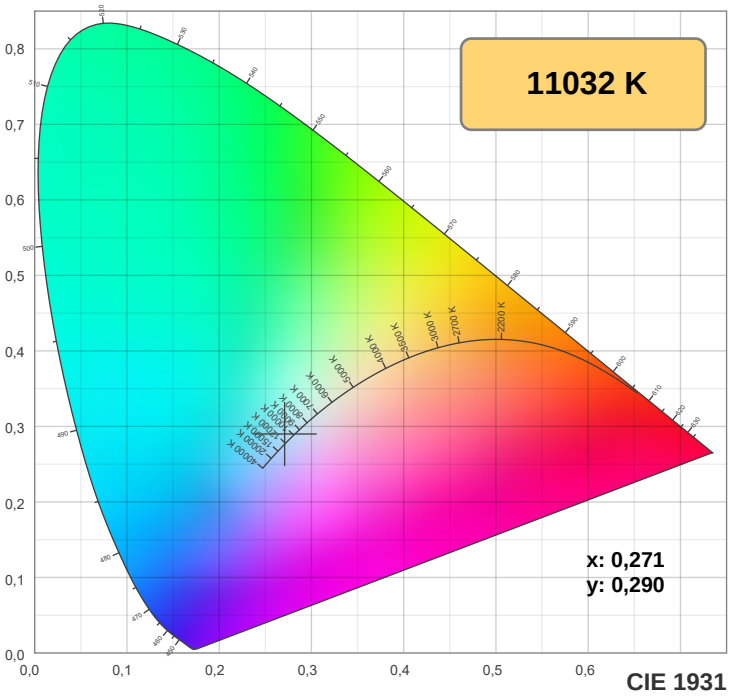
**Spectra**



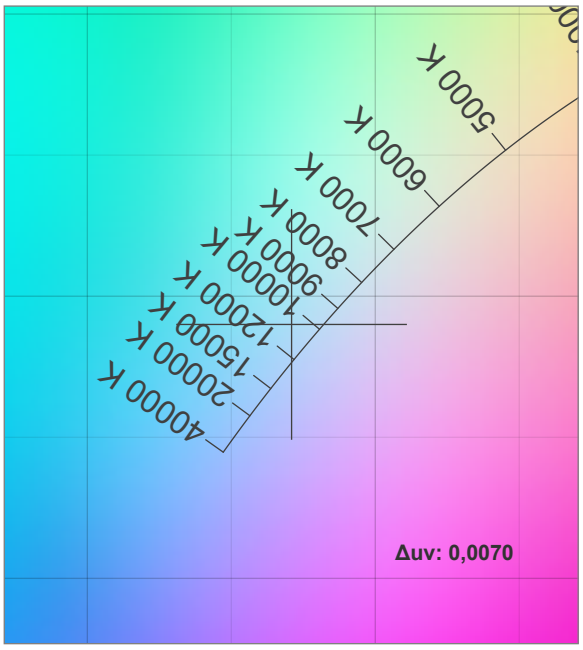

**Power**



# Color details

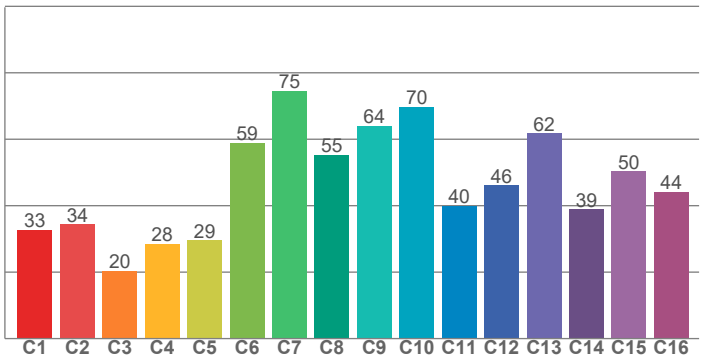



CIE 1931

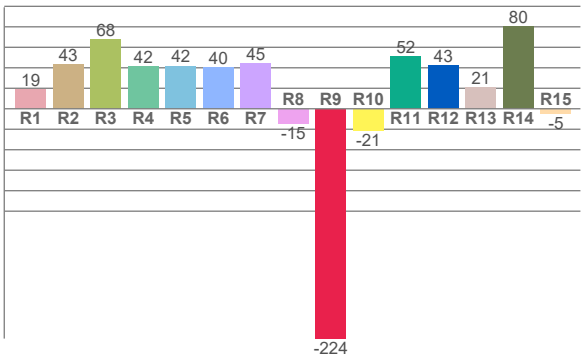



CIE 1931 ZOOM

## TM30: 45,9




## CRI: 35,5 (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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 19,0 | 43,0 | 67,8 | 41,8 | 42,0 | 40,2 | 44,5 | -14,6 | -224,4 | -21,3 | 51,5 | 42,8 | 21,0 | 80,4 | -5,3 |

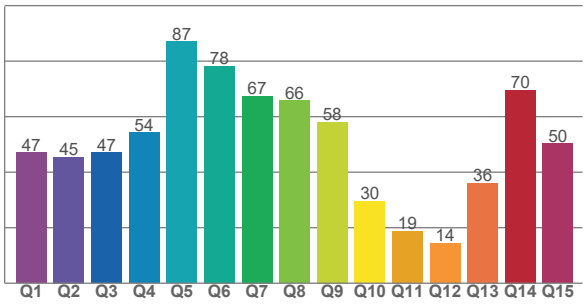
**TM30 C values, 16 binned values out of total of 99 C values**

| C1 | C2 | C3 | C4 | C5 | C6 | C7 | C8 | C9 | C10 | C11 | C12 | C13 | C14 | C15 | C16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 32,7 | 34,3 | 20,4 | 28,5 | 29,5 | 59,0 | 74,6 | 55,4 | 64,1 | 69,7 | 40,0 | 46,2 | 61,7 | 38,9 | 50,3 | 44,1 |

**CQS Q values**

| Q1 | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 | Q11 | Q12 | Q13 | Q14 | Q15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47,0 | 45,5 | 47,1 | 54,3 | 87,1 | 78,2 | 67,5 | 65,8 | 58,1 | 29,5 | 18,9 | 14,4 | 36,1 | 69,6 | 50,3 |

## CQS: 46,8




## 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 |
| 11032 K | 35,5 | -224,4 | 45,9 | 89,5 | 46,8 | 0,271 | 0,290 | 0,183 | 0,293 | 0,0070 |

# TM30 details

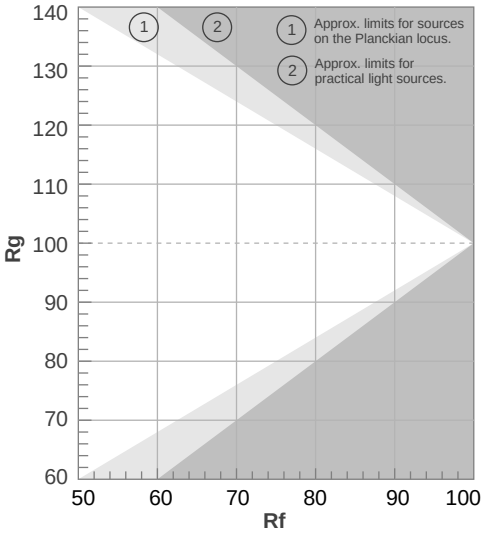
**Rf 45,9**

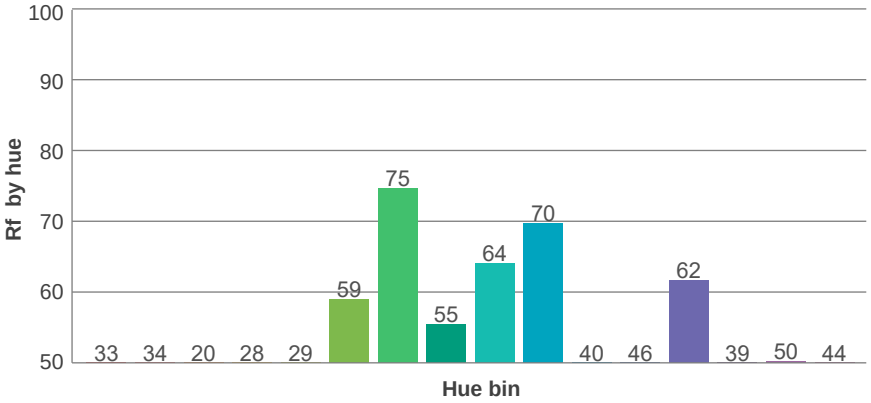
Fidelity index Rf

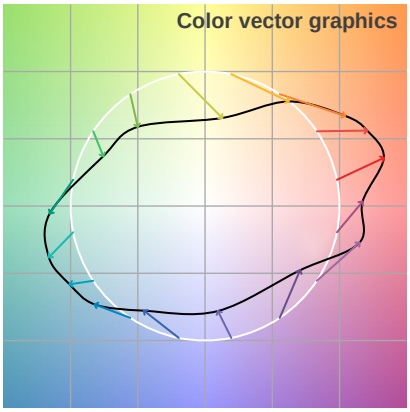
**Rg 89,5**

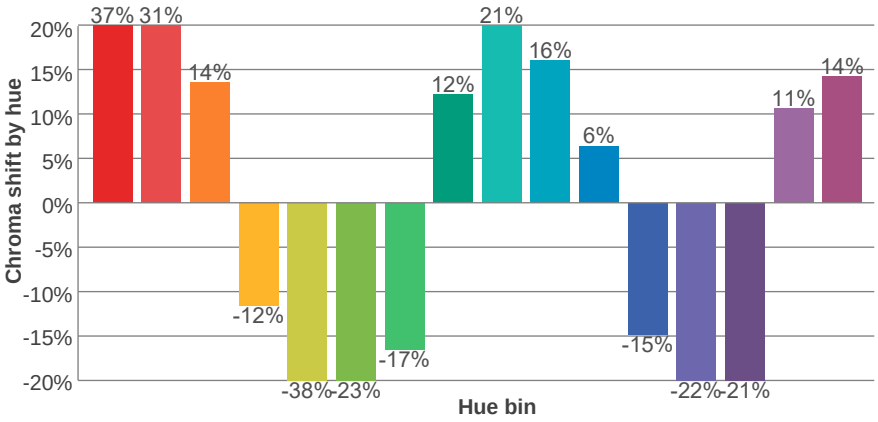
Gammut index Rg

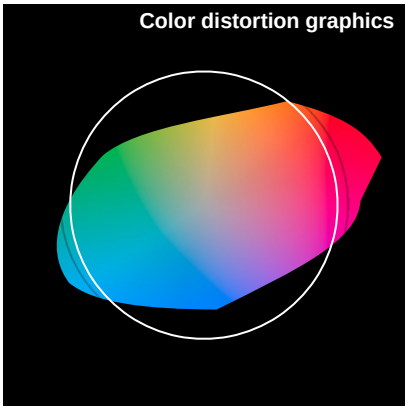
| | | Graphic shifts (%) | |
|---|---|---|---|
| Hue Bin | $R_f$ | Chroma | Hue |
| 1 | 33 | 37% | 9% |
| 2 | 34 | 31% | -20% |
| 3 | 20 | 14% | -49% |
| 4 | 28 | -12% | -46% |
| 5 | 29 | -38% | -25% |
| 6 | 59 | -23% | 9% |
| 7 | 75 | -17% | 11% |
| 8 | 55 | 12% | 28% |
| 9 | 64 | 21% | 15% |
| 10 | 70 | 16% | -8% |
| 11 | 40 | 6% | -28% |
| 12 | 46 | -15% | -29% |
| 13 | 62 | -22% | -6% |
| 14 | 39 | -21% | 32% |
| 15 | 50 | 11% | 41% |
| 16 | 44 | 14% | 26% |

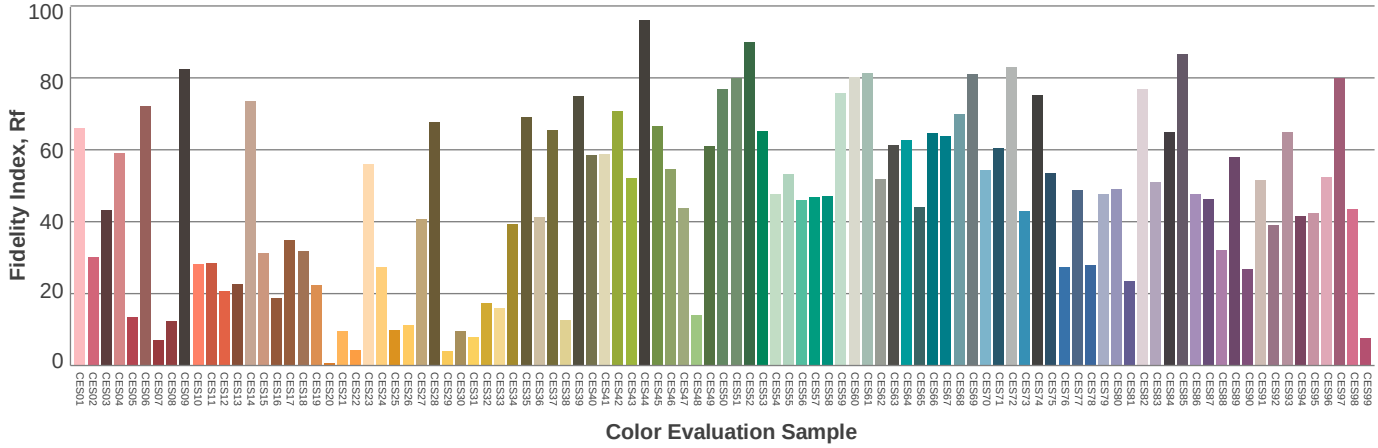


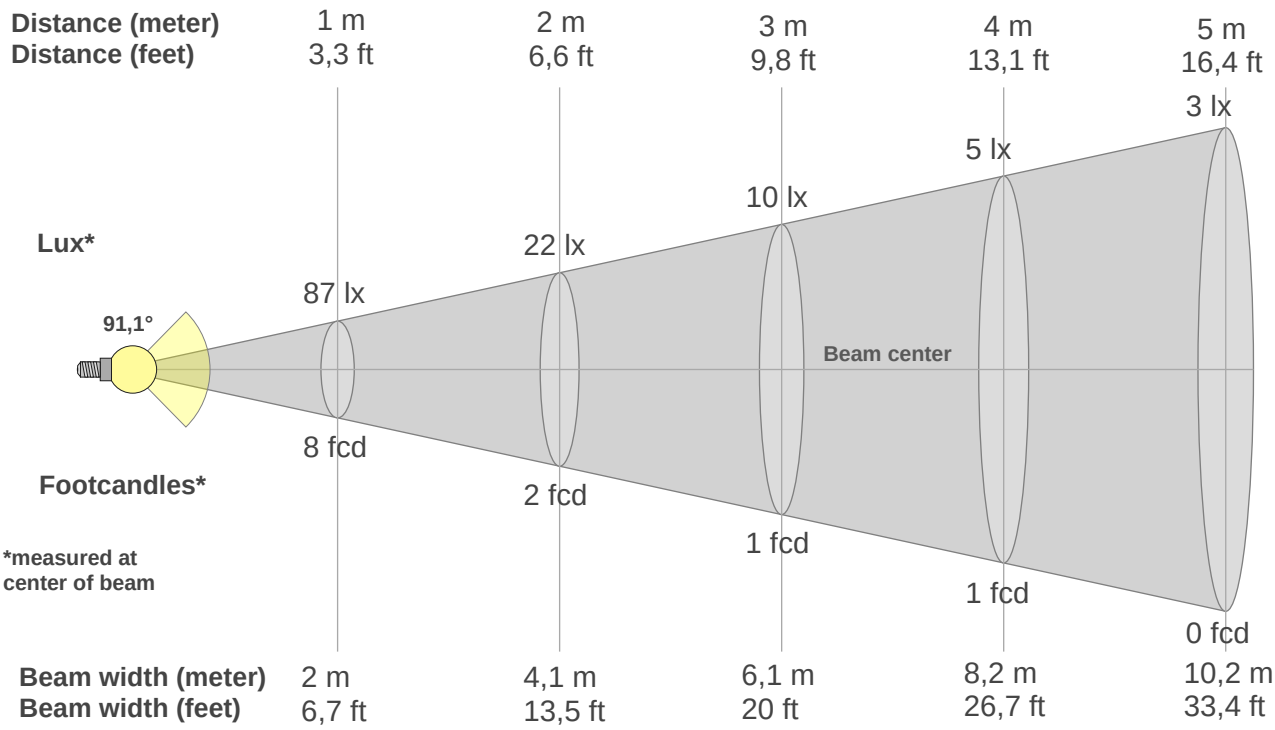



# Beam details




**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 |
| 87lx | 22lx | 10lx | 5lx | 3lx | 2lx | 2lx | 1lx | 1lx | 1lx | 1lx | 1lx | 1lx | 0lx | 0lx | 0lx | 0lx | 0lx | 0lx | 0lx |
| 8,1fcd | 2fcd | 0,9fcd | 0,5fcd | 0,3fcd | 0,2fcd | 0,2fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0,1fcd | 0fcd | 0fcd | 0fcd | 0fcd | 0fcd | 0fcd | 0fcd | 0fcd |

**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° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86,9 | 86,2 | 84,3 | 80,4 | 75,5 | 69,6 | 63,1 | 56,4 | 49,8 | 44,0 | 38,5 | 33,4 | 28,0 | 23,5 | 19,1 | 15,4 | 11,4 | 8,3 | 3,4 | 0,0 |
| 100% | 99% | 97% | 93% | 87% | 80% | 73% | 65% | 57% | 51% | 44% | 38% | 32% | 27% | 22% | 18% | 13% | 10% | 4% | 0% |

**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° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86,9 | 86,1 | 84,2 | 81,1 | 76,8 | 71,6 | 65,8 | 59,1 | 51,8 | 44,6 | 37,8 | 30,7 | 24,6 | 18,5 | 13,8 | 9,3 | 5,9 | 2,7 | 0,7 | 0,7 |
| 100% | 99% | 97% | 93% | 88% | 82% | 76% | 68% | 60% | 51% | 43% | 35% | 28% | 21% | 16% | 11% | 7% | 3% | 1% | 1% |

**Intensities in 180° c-plane**

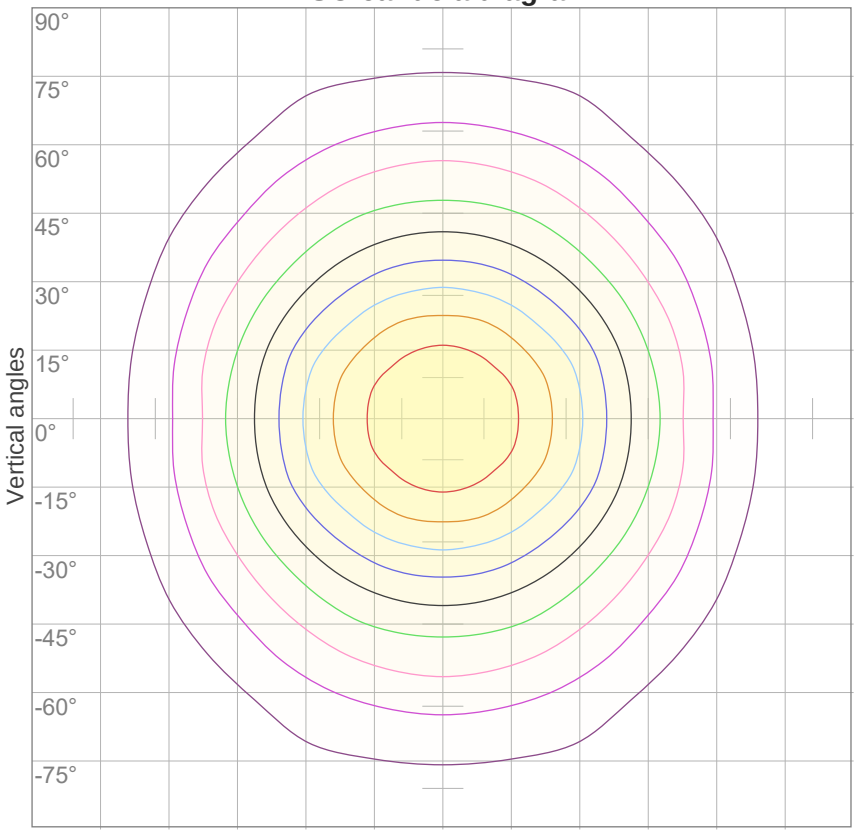
| 0° | 5° | 10° | 15° | 20° | 25° | 30° | 35° | 40° | 45° | 50° | 55° | 60° | 65° | 70° | 75° | 80° | 85° | 90° | 95° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86,9 | 86,2 | 84,3 | 80,4 | 75,5 | 69,6 | 63,1 | 56,4 | 49,8 | 44,0 | 38,5 | 33,4 | 28,0 | 23,5 | 19,1 | 15,4 | 11,4 | 8,3 | 3,4 | 0,0 |
| 100% | 99% | 97% | 93% | 87% | 80% | 73% | 65% | 57% | 51% | 44% | 38% | 32% | 27% | 22% | 18% | 13% | 10% | 4% | 0% |

**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° |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 86,9 | 86,1 | 84,2 | 81,1 | 76,8 | 71,6 | 65,8 | 59,1 | 51,8 | 44,6 | 37,8 | 30,7 | 24,6 | 18,5 | 13,8 | 9,3 | 5,9 | 2,7 | 0,7 | 0,7 |
| 100% | 99% | 97% | 93% | 88% | 82% | 76% | 68% | 60% | 51% | 43% | 35% | 28% | 21% | 16% | 11% | 7% | 3% | 1% | 1% |

| Beam angle 50% | Field angle 10% | Cutoff angle 2,5% | Intensity ratio in 120° cone | Intensity ratio in 90° cone |
|---|---|---|---|---|
| **91,1°** | **161,6°** | **201,8°** | **77,5%** | **55,8%** |

## ISO candela diagram



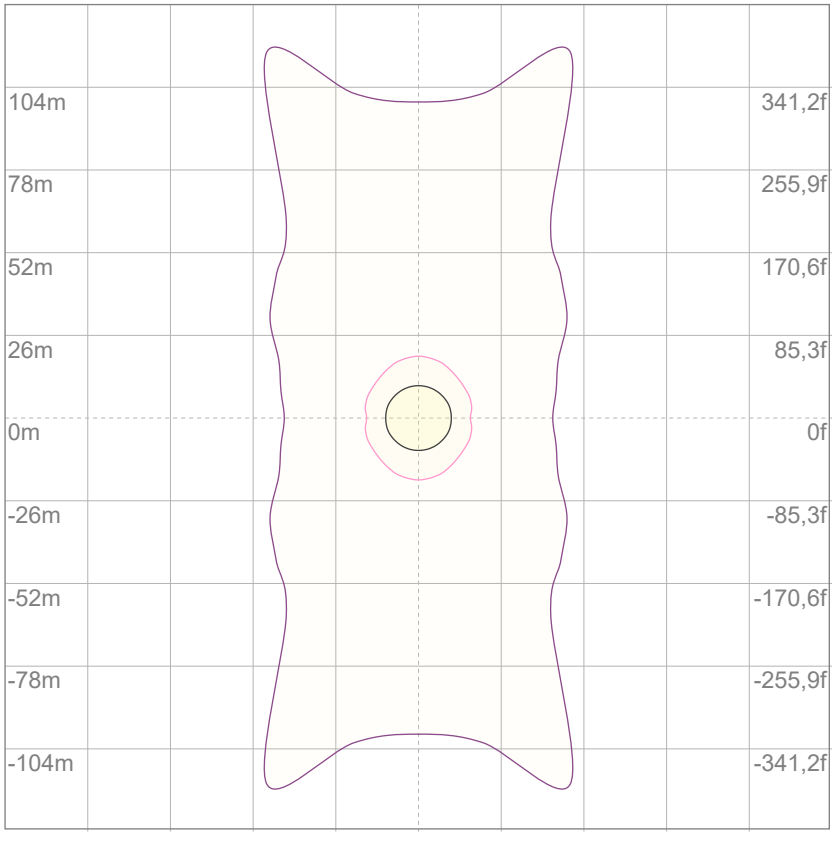

| | |
|---|---|
| 10% | 9 cd |
| 20% | 17 cd |
| 30% | 26 cd |
| 40% | 35 cd |
| 50% | 43 cd |
| 60% | 52 cd |
| 70% | 61 cd |
| 80% | 69 cd |
| 90% | 78 cd |

Conditions:

Number of c-planes: 16

Candela at center: 87 cd

## ISO lux diagram




Mounting height: 10 meters (33 feet)

| | |
|---|---|
| 3% | 26,1m lx |
| 5% | 43,4m lx |
| 10% | 86,9m lx |
| 30% | 0,261 lx |
| 50% | 0,434 lx |

Conditions:

Number of c-planes: 16

Lux at center: 0,869 lx

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

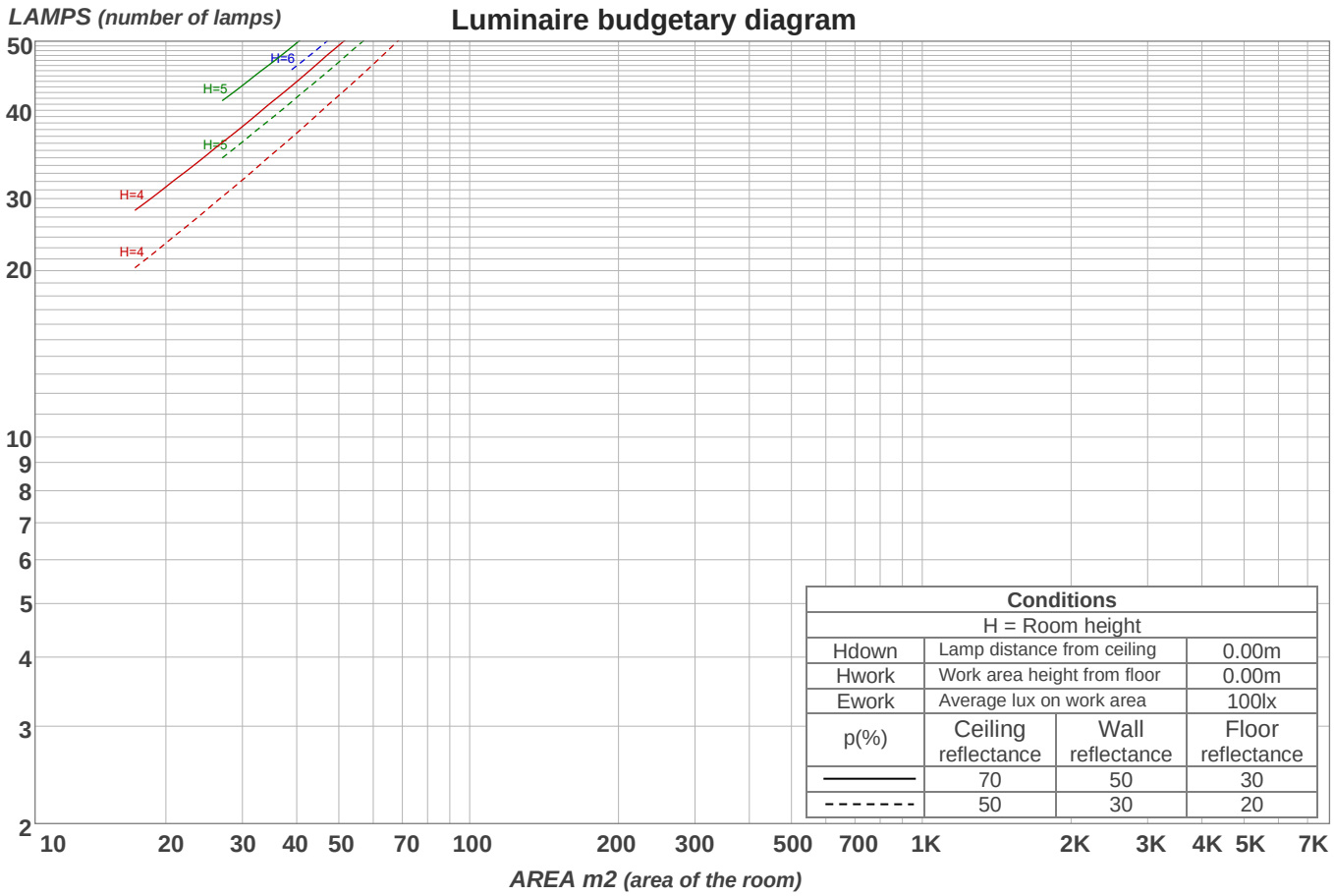
## Glare Evaluation According to UGR

| 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 | 16,2 | 17,4 | 16,4 | 17,7 | 17,9 | 16,9 | 18,0 | 17,1 | 18,3 | 18,6 |
| | 3H | 17,4 | 18,6 | 17,8 | 18,9 | 19,1 | 17,9 | 19,2 | 18,4 | 19,5 | 19,7 |
| | 4H | 18,0 | 19,2 | 18,4 | 19,4 | 19,7 | 18,4 | 19,6 | 18,8 | 19,9 | 20,1 |
| | 6H | 18,5 | 19,6 | 18,8 | 19,8 | 20,2 | 18,9 | 19,9 | 19,2 | 20,2 | 20,6 |
| | 8H | 18,7 | 19,7 | 19,0 | 20,0 | 20,4 | 19,0 | 20,0 | 19,3 | 20,3 | 20,7 |
| | 12H | 18,9 | 19,8 | 19,2 | 20,2 | 20,6 | 19,0 | 20,0 | 19,4 | 20,4 | 20,8 |
| 4H | 2H | 16,7 | 17,9 | 17,1 | 18,1 | 18,4 | 17,2 | 18,4 | 17,6 | 18,7 | 18,9 |
| | 3H | 18,2 | 19,2 | 18,6 | 19,6 | 20,0 | 18,6 | 19,6 | 19,0 | 19,9 | 20,4 |
| | 4H | 18,9 | 19,8 | 19,3 | 20,2 | 20,7 | 19,1 | 20,0 | 19,6 | 20,5 | 21,0 |
| | 6H | 19,5 | 20,4 | 20,0 | 20,7 | 21,1 | 19,6 | 20,5 | 20,1 | 20,9 | 21,2 |
| | 8H | 19,7 | 20,5 | 20,2 | 20,9 | 21,3 | 19,8 | 20,6 | 20,3 | 21,0 | 21,4 |
| | 12H | 20,0 | 20,6 | 20,5 | 21,0 | 21,5 | 19,9 | 20,6 | 20,4 | 21,0 | 21,5 |
| 8H | 4H | 19,1 | 19,9 | 19,6 | 20,3 | 20,7 | 19,4 | 20,2 | 19,9 | 20,5 | 20,9 |
| | 6H | 19,9 | 20,5 | 20,4 | 21,0 | 21,5 | 20,0 | 20,6 | 20,5 | 21,1 | 21,6 |
| | 8H | 20,3 | 20,8 | 20,8 | 21,3 | 22,0 | 20,3 | 20,8 | 20,8 | 21,3 | 22,0 |
| | 12H | 20,6 | 21,1 | 21,2 | 21,6 | 22,2 | 20,5 | 20,9 | 21,1 | 21,4 | 22,0 |
| 12H | 4H | 19,1 | 19,8 | 19,6 | 20,2 | 20,7 | 19,4 | 20,0 | 19,9 | 20,5 | 20,9 |
| | 6H | 20,0 | 20,5 | 20,5 | 21,0 | 21,7 | 20,1 | 20,6 | 20,6 | 21,1 | 21,8 |
| | 8H | 20,4 | 20,8 | 21,0 | 21,4 | 22,0 | 20,4 | 20,8 | 21,0 | 21,3 | 21,9 |
| Variation of the observer position for the luminaire distance S | | | | | | | | | | | |
| S = 1.0H | | 0,1 / -0,1 | | | | | 0,1 / -0,1 | | | | |
| S = 1.5H | | 0,2 / -0,3 | | | | | 0,3 / -0,4 | | | | |
| S = 2.0H | | 0,4 / -0,5 | | | | | 0,7 / -0,8 | | | | |
| Standard table | | n/a | | | | | n/a | | | | |
| Correction summand | | n/a | | | | | n/a | | | | |
| Corrected glare indices referring to 210 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 | 104 | 104 | 104 | 99 | 99 | 99 | 97 |
| 1 | 108 | 103 | 99 | 95 | 105 | 101 | 97 | 93 | 96 | 93 | 90 | 91 | 89 | 86 | 87 | 85 | 83 | 81 |
| 2 | 99 | 90 | 84 | 78 | 96 | 88 | 82 | 77 | 84 | 79 | 75 | 81 | 76 | 73 | 77 | 74 | 70 | 68 |
| 3 | 90 | 80 | 72 | 65 | 87 | 78 | 71 | 65 | 75 | 68 | 63 | 72 | 66 | 62 | 69 | 64 | 60 | 58 |
| 4 | 83 | 71 | 63 | 56 | 80 | 70 | 62 | 55 | 67 | 60 | 54 | 64 | 58 | 53 | 62 | 57 | 52 | 50 |
| 5 | 76 | 64 | 55 | 49 | 74 | 63 | 54 | 48 | 60 | 53 | 48 | 58 | 52 | 47 | 56 | 50 | 46 | 44 |
| 6 | 71 | 58 | 49 | 43 | 69 | 57 | 49 | 43 | 55 | 47 | 42 | 53 | 46 | 41 | 51 | 45 | 41 | 39 |
| 7 | 66 | 53 | 44 | 38 | 64 | 52 | 44 | 38 | 50 | 43 | 37 | 48 | 42 | 37 | 47 | 41 | 37 | 35 |
| 8 | 61 | 48 | 40 | 34 | 60 | 47 | 40 | 34 | 46 | 39 | 34 | 44 | 38 | 33 | 43 | 37 | 33 | 31 |
| 9 | 58 | 44 | 36 | 31 | 56 | 44 | 36 | 31 | 42 | 35 | 31 | 41 | 35 | 30 | 40 | 34 | 30 | 28 |
| 10 | 54 | 41 | 33 | 28 | 53 | 41 | 33 | 28 | 39 | 33 | 28 | 38 | 32 | 28 | 37 | 32 | 27 | 26 |

## Luminaire budgetary diagram

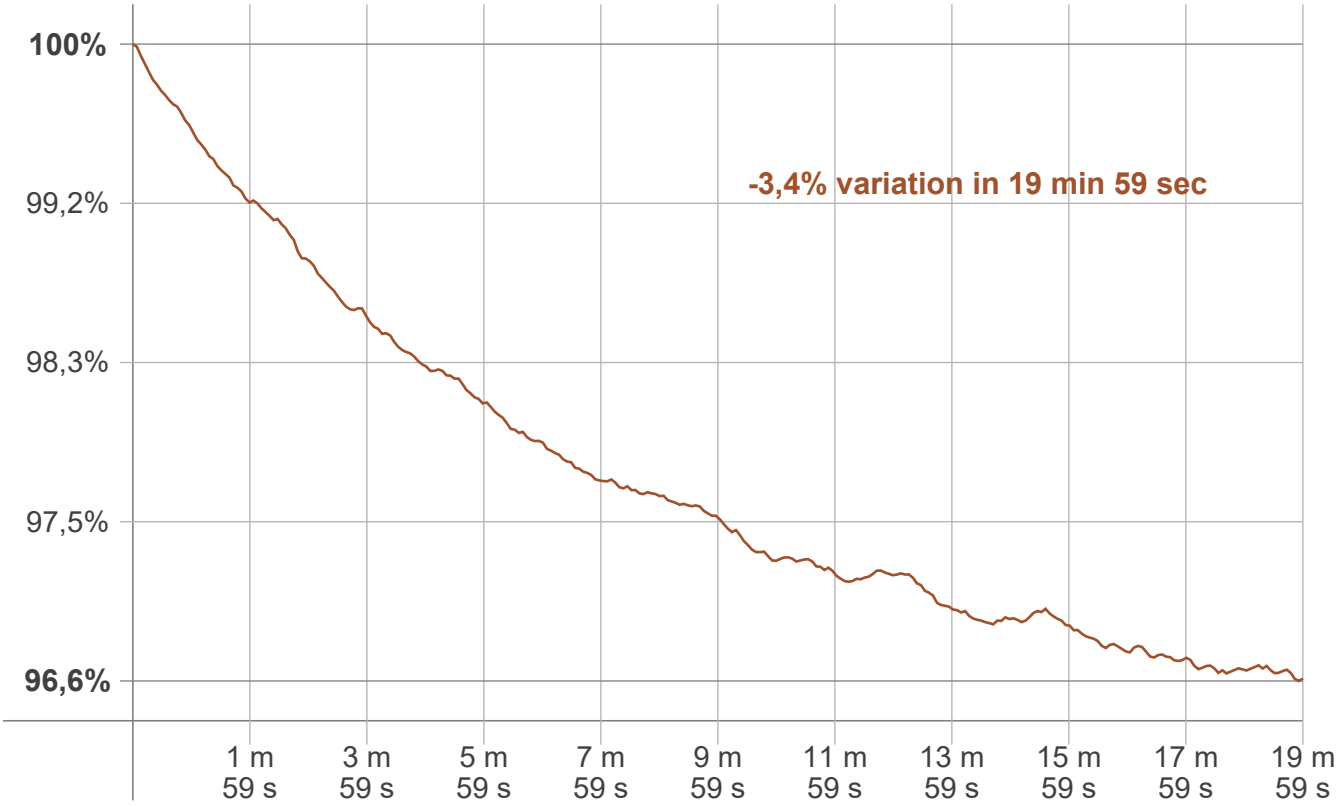



## Zonal Lumen Summary

| 0°-10° | 10°-20° | 20°-30° | 30°-40° | 40°-50° | 50°-60° | 60°-70° | 70°-80° | 80°-90° |
|---|---|---|---|---|---|---|---|---|
| 8,17 lm | 22,7 lm | 32,5 lm | 36,2 lm | 34,2 lm | 28,8 lm | 21,3 lm | 13,5 lm | 6,60 lm |

| 90°-100° | 100°-110° | 110°-120° | 120°-130° | 130°-140° | 140°-150° | 150°-160° | 160°-170° | 170°-180° |
|---|---|---|---|---|---|---|---|---|
| 1,56 lm | 1,24 lm | 1,09 lm | 0,724 lm | 0,463 lm | 0,347 lm | 0,256 lm | 0,157 lm | 0,053 lm |

## Warmup curve




## Warmup result

| | |
|---|---|
| **Warmup time:** | **Lamp stabilized in 19 min 59 sec** |
| **Warmup variation** | **-3,4%** |

## Warmup conditions

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

## Color temperature change

| CCT start | CCT change | CCT end |
|---|---|---|
| 10679 K | +353 K | 11032 K |

## Output change

| Output start | Output change | Output end |
|---|---|---|
| 218 lm | -8 lm | 210 lm |